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A NEW  
MANUAL OF METHOD

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A. H. GARLICK, B.A.  
(HEAD MASTER OF THE WOOLWICH P.T. CENTRE)

*NEW IMPRESSION*

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## PREFACE.

SOME years' experience in the teaching of School Method has demonstrated that young students require much more help in this subject than is offered in existing manuals, and that the information contained should be offered in its most serviceable form. In fact, "Centre" experience has shown that no book is suitable unless it is comprehensive in its range, practical in its nature, and modern in its methods. There are books in the market meeting some of these requirements, but none meeting them all. The subject is very wide; the time that can be allotted to it very small: hence the book should be such as to do most of its own teaching. For this reason all the subject matter has been carefully methodised, and much of it thrown into teaching form—the form which is most difficult to young teachers to acquire, and the most useful in practice.

This work is based on the writer's teaching notes during the past ten years; and as it grew to meet the wants of his own pupils for their recurring examinations, it is believed that it will be found specially suitable for pupil teachers, scholarship students, and students in training.

Every Examination Question in the book is selected from the papers set at the various Government Examinations held for Teachers.

A. H. G.

WOOLWICH P.T. CENTRE,  
1896.

## PREFACE TO THE SEVENTH EDITION.

**SUBSTANTIAL** alterations and substitutions have been made in the present and the last Editions with a view to rejuvenating the book and keeping it up to date.

A. H. G.

**GREENWICH, 1907.**

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# A NEW MANUAL OF METHOD.

## CHAPTER I.

### SCHOOL ECONOMY.

**Physiology and Education.**—Education is three-fold—moral, mental and physical. Physical education demands some knowledge of Physiology, just as mental and moral teaching is all the better for some knowledge of Psychology. Many young teachers learn some of the elements of Psychology during their training; all should learn the elements of Physiology.

**1. The Popular View.**—The popular mind recognises the close connection between Education and Physiology in the use of its maxims and metaphors; e.g., a sound mind in a sound body; an angry man is said to have had his *bile* stirred up; a sad or morose individual is said to be *melancholy* (*melan*, black; *chole*, bile); an irritable or bad-tempered person often throws the blame on his *liver* or *nerves*; a vindictive creature is said to be *splendetic*; mercy is associated with the *bowels* (bowels of mercy), and the gentler emotions with the *heart* (tender-hearted).

**2. The Scientific View.**—The body is an aggregate of organs. Fatigue the body and the organs suffer. But certain organs are the physiological support of the brain, hence the *brain* suffers.

Mental activity goes with *physical activity*; but too much physical exercise is unfavourable to mental work and mental development. Conversely, too much mental activity impairs the bodily health, as it is seen in the case of brain-workers who suffer from headaches, nervous disorders, indigestion, etc.

*Memory*, physiologically, is a series of new nervous growths, and these nervous growths are supported by *nutrition*, which is a physiological process. Memory is, furthermore, a plastic property of the mind, and this plasticity may be injured by too little or too much work. But to increase this plasticity the brain must be worked. All these facts show that if the teacher is to treat the subject of Education scientifically and progressively, he must be well grounded in the elementary principles and truths of Physiology, paying special attention to that part—nutrition—which is the basis of support to all the organs of the body.

**Headaches and Faintness.**—Headaches arise from various causes, which may require separate treatment. They may arise from diet, or from an impure atmosphere; from mental causes, from overwork, or from physical causes.

**1. Food Headaches.**—Luxury and overfeeding may be, but in elementary schools rarely are, causes of headaches. Over-indulgence is not very prevalent,

but improper diet is a fruitful source. Costiveness is one result, and this causes an undue quantity of blood to flow to the head, which generates a headache. Excessive use of aperient medicine, and hearty suppers, are other causes. Digestive disorders cause sick headaches, and, generally, anything which tends to interfere with the circulation must be avoided. As a remedy, Domestic Economy lessons must be utilised to encourage the pupil to take plenty of exercise; to explain the nature and effects of stimulating food; to avoid all foods which make too much flesh, and to drink water only.

**2. From Impure Atmosphere.**—If there be too much  $\text{CO}_2$  in the air, giddiness sets in. The pressure of the  $\text{CO}_2$  in the air retards the elimination of the  $\text{CO}_2$  from the lungs, and general nutrition is impaired. A headache is then one of the results. Coke fires give off  $\text{CO}$ , which displaces  $\text{O}$  from the red corpuscles, impoverishes the blood, and causes headaches. Sulphurous acid, which is always in the air of towns, and near fires, is also bad. Organic putrescible matter which is breathed forth from the lungs, exhalations from sickly boys, and the fœtid smell arising from damp clothing all taint the air and produce headaches. Foul gases from bad drainage and damp basements, the dust in the air, chalk dust and similar impurities, and an overheated temperature are other causes. The remedy is to seek the cause, and if possible remove it. The lessons on health should lead to prevention, but some of these causes will be beyond the teacher's control. Pure air and a proper diet, however, always tend to cure.

**3. From Mental Causes.**—The child may be overworked. The lessons may be too exacting for the constitution of some. The excitement of examinations, anxiety, worry, etc., will all produce headache at times. In such cases the teacher should shorten the hours of study, recommend more exercise, and the keeping of the body well nourished.

**4. From Physical Causes.**—These will include such things as tight lacing, tight collars, tight boots, etc., too little or too much muscular exercise, insomnia. The quantity of sleep required depends very largely on the work and temperament of each individual. The sufferers should be advised to dress reasonably, to regulate the quantity of exercise taken, and to indulge in a fair amount of sleep.

**LIGHT.**—"Light goes with knowledge, and assists to develop mental power."

#### 1. Direction of Light.

- (1) It must not come direct from the front. This is its worst direction.
- (2) It should come from a point on either side, the *left* being the best, especially for class rooms. All other windows in class rooms should be regarded as supplementary, or for summer ventilation.
- (3) Or, it should come from a point above the shoulder.
- (4) Or, from behind.
- (5) It must not enter from both sides of the room, unless the room is very large. At the same time, no school should be lighted from one side only, but the gable ends should be fully utilised for light.

#### 2. Diffusion of Light.

- (1) Light should be equally diffused throughout the room.
- (2) The main light should be from the north, because it is steadier and cooler.
- (3) The light should be abundant, but all glare should be avoided. Hence southern windows are not the best, although there should be one southern window for cheerfulness.
- (4) The colour of the walls should assist, and grey is best for this purpose. All kinds of glazing which diminish the light and are troublesome to keep in repair should be avoided.
- (5) The sills of the main lighting windows should be placed about four feet above the floor, and the tops of some should always reach nearly to

the ceiling. In fact, the higher the windows rise to the ceiling, the better for light and ventilation. A dim religious light may be good for sentiment, but it is bad for health. If the windows can be placed six or seven feet above the ground, so much the better, for the diffusion of light is better, and shadows are avoided.

- (6) When windows are low, side lights are preferable, and the left side is always the best.
- (7) A domed roof is best for light, whilst flat skylights should be protected by proper blinds.
- (8) A large portion of each window should be made to open for ventilation and cleaning.

**3. Artificial Light.**—Wall lights are bad, because the air soon becomes impaired. Cross lights are to be avoided, because they multiply shadows. Gas is not a desirable form of lighting from a hygienic point of view, although the neandescend gaslight system is a great advance in this form of lighting. The electric light would be an improvement.

**VENTILATION.**—The teacher should be acquainted with its main principles.

**1. Its Difficulties.**—These arise from various causes.

- (1) The different forms of building in use.
- (2) The aspect of the rooms.
- (3) The nature, size, and position of the surrounding objects.
- (4) The difference of constitution, temperament, and health.
- (5) Overcrowding.

It will be easily understood that what may be a good arrangement for one building may fail to suit another. If the windows face the prevailing winds, and these happen to be of an unfavourable nature, then further difficulties are raised. High buildings, objectionable factories, etc., when near, are all serious considerations. But perhaps the most important of all is the negligence of many to use the means at their disposal for good ventilation.

**2. Cubic Space.**—Cubic space is but little guide in school statistics, for the number of children a room can accommodate depends on several things which do not enter into the usual considerations of these matters. Furthermore, the age of the children is an important factor. The Government recommends the following desk space:—

18 inches	for each junior desk.
22	“ senior “
18	“ the gangway.

But on the point of health this is not satisfactory. We each breathe about 6 times a minute, or 960 times in an hour, and every breath helps to vitiate the air. Each adult destroys 16·6 cubic feet of air per hour, 100 times that quantity per hour being required to keep the air pure. Remember that three scholars equal two adults. Now, in pure air we have '04 of  $\text{CO}_2$ , and 1 per cent. will give a headache, whilst 4 per cent. would be fatal. Overcrowding or bad ventilation produces too much  $\text{CO}_2$ , and concurrently, a foetid smell often arises. Other evils are the raising of the temperature and the production of draughts, and to obviate these evils the room should be flushed at regular intervals. This is the simplest method of ventilation, and often the only one the teacher can employ.

**3. Means of Ventilation.**

- (1) **Doors and Windows.**—All windows should be made to open top and bottom; a slight opening both top and bottom being effectual. Windows are best for ventilation, and the window space should be at least one-fifth of the wall space. A small swing window, as far from the lighting windows as possible, and near the ceiling, is important.
- (2) **Gratings.**—These can be used in connection with fireplaces and stoves.
- (3) **Shafts.**—Shafts like the vertical shaft ventilators can be used. For the admission of fresh air a Tobin ventilating shaft in the corner of the



room is recommended. It should communicate below with the outer air, and open about seven feet above the floor, so as to introduce a current of air where no draught will be felt by the head.

(4) **Ventilators.**—The principal use of these is to prevent the collection of stagnant air. There are many good kinds in the market, including the cowl ventilator, Arnot's Balance Valve, and the Louvre Ventilators.

(5) **Fireplaces.**—A wide open chimney is desirable in small rooms, but they are unsatisfactory in large rooms. Ordinary closed stoves are bad. There should be provision for the outlet of foul air at the highest point of the room. This can be best done by building to each room a separate air chimney, carried up in the same stack as the smoke flues. An outlet should always be warmed in some manner, or it will frequently act as a cold inlet. The exits for foul air should be greater than the entrances for pure air.

**WARMING.**—The warming should be moderate, and evenly distributed, so as to maintain a temperature of from 56° to 60° F. When a corridor or lobby is warmed, the rooms are more easily dealt with, and are less liable to cold draughts. Where schools are wholly warmed by hot water, the principle of direct radiation is recommended. In such cases open grates are occasionally useful for extra warming, and their flues for ventilation always. Stoves can only be allowed if they are provided with proper chimneys, and are found not to contaminate the air, or to render it too dry.

**The Thermometer.**—The walls of a school should never be allowed to cool down below 45° F. night or day. An equable and suitable temperature is a great desideratum for warming. The thermometer should not be hung near a fireplace or stove, nor in the direction of any draught, nor in too close contact with gas. It may be hung upon a wall as near the centre of the room as possible, provided it does not infringe any of the above suggestions. It must be hung where it will give the best measure of the average temperature of the room, and this will depend very largely upon the plan or shape of the room, and its locality.

**Cleaning.**—The following suggestions apply to the school, and not to the home:—

1. The school should be swept and dusted each day
2. The floor should be scrubbed every few weeks.
3. The windows should be cleaned as often as the weather and other circumstances make it necessary; but in any case once a quarter.
4. Stoves and fireplaces should be cleaned weekly. When fires cease, the stoves, etc., should be fresh painted.
5. The walls should be swept down once a month (oftener in some cases), and the pictures, maps, and diagrams dusted. All framed pictures should be washed once or twice a year.
6. Every three to seven years, depending on the neighbourhood and use of the schoolrooms, the whole building should be painted inside and out.

**Drill.**—Drill is perhaps the chief recognised means of promoting Physical Education in the school, whilst the encouragement and carrying out of games is the chief means outside the school. Both are essential to the maintenance of a good standard of health.

**I. Its Objects.**—These may be briefly enumerated as follows:

1. To promote an improved blood circulation.
2. To take away from the muscular system a tendency to improper contraction.
3. To aid in the formation of proper habits of subjection.
4. To act as a check against absent-mindedness.
5. To promote a love of order.
6. To afford an easy and effectual mode of promoting habits of prompt obedience.
7. To harden and develop the muscular system generally. To improve the health by a proper action of all the organs.

A consideration of the above will show the two main functions of drill to be a cleansing process and development. Its influence is very wide, for it makes healthy subjects and law-abiding citizens. It quickens the actions, and the mind sometimes, and so makes better men of business. It encourages habits of neatness, promptness, cleanliness, ready obedience, and order. It develops a love of action, which finds vent in our national games, and so acts as a great moral agent.

**II. General Principles and Rules.**—These are largely gathered from observing children at play.

1. Movements should not be confined to arms alone. The various postures into which children unconsciously throw themselves show the necessity of exercise for every part of the body.
2. No one part of the body should be exercised too long. Children illustrate this law by their constant change of games.
3. Begin with easy movements first; then follow with the more fatiguing ones; *i.e.*, the training should be gradual.
4. The lessons should be frequent and regular. A few minutes each day is better than one long lesson per week. In fine weather use the playground; in bad weather, the largest room.
5. The children must be suitably dressed. Tight fitting garments are injurious.
6. Respiration should be perfectly free during exercise; the chest well expanded, the head erect. A child suddenly getting red in the face should be told to breathe freely, as checked or impeded respiration is often the cause of the raised colour.
7. Pallor is a sign that the exercise is too severe. Withdraw such children immediately.
8. Each movement has a definite aim in the physical education of the body. Teachers should strive to achieve this aim by insisting on precision and steadiness of movement.
9. The children should stand at arm's length from each other.
10. Give a few seconds' rest between each movement.
11. The teacher should correctly perform each new movement before commanding it to the class.
12. Corrections should be short and clear. They should be made when children are resting.
13. Each movement should be repeated three or four times.
14. The "word of attention," which tells children what movement is to be taken, should be given in a calm, descriptive manner.
15. The "word of execution" should be given in a sharp, decisive manner as a rule.

**THE PLAYGROUND.**

**I. Physical Uses.**—A playground is the lung of a school. It is as essential to a proper and efficient education as the school-room itself. It is the workshop for the manufacture of the sound body, as the schoolroom is for the sound mind. It offers relief after mental work, and brings into play the overcramped muscles. It is a healthy agency for the overflow of that abundant spontaneity of child life, which may become so troublesome to discipline if not regulated.

**II. Its Fittings.**—A playground should be fitted with gymnastic apparatus, like the giant-stride, parallel bars, etc., and a drinking fountain. One portion should always be covered in to meet cases of bad weather. Offices should be provided, and should meet all requirements of cleanliness, decency, and accommodation. It should be well detached from the street (in towns), by a high wall, by position, or by both. If large, around its edges and near the walls, a narrow strip might be devoted to the cultivation of shrubs, flowers, etc. It should be asphalted if possible, and drained by the placing of small sinks, and the slight sloping of the playground towards them.

**III. Its Moral Uses.**—It brings brightness to the school life, and helps to engender a love for school by making it popular. It is a fine training ground for the emotions. Boys learn to discipline themselves in their sport, to submit their wills to the will of others. It is a great leveller and compensating force; for the dullard may be a physical adept. He wins in the playground that respect which he cannot attain in the school; for muscle is worshipped as much as brain. The bully is checked, the timid and shy get nerve and confidence by means of the playground's supervised play.

**IV. The Teacher's Work.**—Gymnastics should be encouraged by the teacher, and, in the case of boys, a little instruction might be given. Supervision should always be exercised. The presence of the teacher will often tempt a boy to try something which otherwise might be beyond his inclination. Games calculated to develop their strength, to give muscular control, to aid the growth of the will, such as our popular games, should be encouraged, sometimes shared, and sometimes directed by the teacher. Many now form and take an active interest in the cricket, football, and swimming clubs of their scholars, and they do not find it unproductive labour.

**FURNITURE.**—Students are expected to know something about the furnishing of a workman's home, and to offer sound opinions on it. Their knowledge is also expected to extend to the school furniture, hence this is thought a convenient place for dealing with several of the more important articles found in a school, such as the school museum, desks, galleries, and wall decorations.

**The School Museum.**—Every school should contain its museum, which should be formed by the pupils and staff so far as its contents are concerned, and should not be purchased. The managers should supply the cupboard only. It should not be turned into a lumber cupboard, or it will smother all interest in itself. The objects of choice will vary somewhat with the district. Regard should be paid to local requirements and local scenery. These considerations will regulate the choice of the special objects for the museum, whilst there will always be a number of objects which may find a place, and these may be called the general objects.

**1. Special Objects.**—These should be classified:—

- (a) **Animal Kingdom.**—There should be specimens of local birds and their eggs, of insects, fish, classified feathers, bills or beaks, feet, etc., of birds, and so on.
- (b) **Vegetable Kingdom.**—There should be a collection of wild flowers belonging to the district, properly pressed and classified. There should also be carefully prepared specimens of the leaf, the flower, the fruit of the trees, the ferns, the grasses, weeds, cereals of the district; sea weed (if near the sea).
- (c) **Mineral Kingdom.**—There should be illustrations of the geological formation of the district. Models of the district should be made and contributed by the teachers or scholars. If the school is near the sea, there should be typical stones and shells from the sea shore.
- (d) **Manufactures.**—The local manufactures (if any) should be illustrated as much as possible. The material used should be shown in its various stages. Models of machines might be made, and models or specimens of tools. If the town is a port, there should be models of the various kinds of ships and boats, and the boys should be taught to distinguish the craft by name (sloop, barque, etc.); to know the flags of the chief countries, and for this purpose a picture of flags should be placed in the schoolroom. If a mining town, the same method should be pursued with the mine.
- (e) **Antiquities.**—There should be drawings, photographs, and specimens illustrating the antiquities and historical associations of near places.

**2. General Objects.**

- (a) **Scientific Apparatus.**—By this is meant apparatus for object lessons and science lessons, and, where possible, this apparatus should be made by the pupils.
- (b) **Commercial Specimens.**—These would include specimens of the chief exports and imports. Where these are objects of manufacture, they should illustrate the whole process from the raw material to the finished article. The specimens must be limited to the chief only, and they

should be arranged in the order of their importance, *i.e.*, our greatest import, export, and manufacture should have their specimens respectively occupying the chief places of their class.

- (c) **Common Objects.**—These should be limited to the commonest specimens of the three productive kingdoms—animal, vegetable, and mineral. Specimens of the chief woods, the chief rocks, etc., should be arranged in the order of their importance. Object lesson materials, in so far as they are not what are technically known as “Scientific,” should also find a place.
- (d) **Inventions.**—It might also be made a receptacle for the inventive faculties of the children, to encourage production according to the special tastes and talents of the pupils, and for this purpose the selection need not be wholly scientific.

### 3. Its Value.

- (a) It is *economical*, because it supplies concrete or objective information to the pupil with the least expenditure, generally, of time and trouble.
- (b) It trains the *attention* by fixing it and bringing *interest* to its aid.
- (c) It stimulates *observation*, and the habit of care which this involves reacts on and influences all their other work.
- (d) A *love of nature* is encouraged, and followed by widened sympathies and enjoyments. In this way it may prove a stepping stone to a love of knowledge, gained by the most productive and the most pleasurable means.
- (e) It affords scope for hand and eye training; for the *cultivation of the senses* by the manufacture of models and apparatus.
- (f) It is a fine *disciplinary aid*. The children love such work, and by association get to like their school, and to take a real pride and interest in it.
- (g) It widens their *vocabulary*. The things observed and described call into use exact and correct *language*, which improves their power of *composition*.

**Galleries.**—Infant children receive many lessons upon galleries, hence it is necessary that each should be properly constructed and properly placed. They are rarely found now anywhere but in Infant Departments. They are conducive to noise very often, and for that reason are not an unmixed blessing in the principal rooms. If the room is large, and the galleries are placed as far apart as possible, the noise is minimised; but a separate class room is the best place for a gallery. On galleries for older children desks might be placed, and then the front desk could rest on the floor. In fact, a gallery then differs very little from the desk-fitted, stepped floors of the modern Council Schools.

The **construction** of the gallery will depend somewhat upon where its place is, and its size also. In a class room it may be larger than in a principal room. A gallery usually contains five parallel seats, each rising above the other like steps. Each seat is about 14 or 15 feet long, depending on the number of children it is intended to seat. It should be so constructed as to allow the youngest children seats at the bottom. The following dimensions are recommended :—

- (1) The *rise of the seat* for the youngest child should not be greater than 7 inches.
- (2) This should be *increased each row by half an inch* for the varying ages and sizes of the children.
- (3) There should be a *gangway up either side*, allowing plenty of room for either teacher or children to ascend or descend. Sometimes there is one central gangway, but this is not so good as the other method.
- (4) There should be a *sloping back* fitted to each seat for the infants, about 8 inches high.
  - (a) It is necessary for health.
  - (b) It leaves the child the free use of its arms. A higher one would not.
  - (c) It protects the child from the restless feet of those on the seat above.
- (5) Each *step* should be nearly 2 feet wide, and the seat should be so placed as to leave at least a foot behind.
- (6) The *walls* should be boarded near the gallery.
- (7) There should be a *hand rail* suited to the size of the children, and placed on the exposed side of the gallery. If both sides are exposed, then there should be a railing on either side.

/ **Desks. I. Infant Departments.**—Desks are used in these departments for writing or for kindergarten. No desks are required for the youngest.

The height varies from  $17\frac{1}{2}$  to  $19\frac{1}{2}$  inches; the seats, from  $10\frac{1}{2}$  to  $11\frac{1}{2}$  inches. The back rests should be curved, and the centre of support should be about 7 inches above the seat. The top of the desk should be flat. It suits for kindergarten, but not for writing, hence the tops should be adjustable so that they could be made horizontal or angular as required.

**II. Other Departments.**—The late London Board issued some *general rules* on this subject, as laid down by their medical officer.

1. The seat should not be so high as to prevent the child resting its feet upon the floor, or on a footboard, and if the latter the knees should not be elevated.

In those classes where the scholars change places, the height of the seat should be capable of regulation in proportion to the height of the pupils.

2. Assuming a child to be sitting upright in his seat, and the arms to be hanging freely down, the edge of the desk next the body should be about an inch higher than the level of the elbows in the boys, and from  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches in the girls.

If the desk be higher than this, there is a tendency for the body to be twisted, for one shoulder to be raised above the other, with the consequent risk of lateral curvature of the spine.

3. A line dropped from the edge of the desk ought to strike the edge of the seat, or at a point an inch or two within it.

This arrangement obliges the child to assume an upright position, which is best both for the eyes and the spine.

4. No seat should be without a back, and the top of this should be one inch lower than the edge of the desk for boys, and one inch higher than the edge of the desk for girls.

In schools which are graded, great inequalities will be found in the size of the scholars in each room, to meet which it would be desirable to provide three sizes of desks. In schools of mixed ages there should be a large number of sizes.

5. The desk must not be flat. It should slightly incline towards the child.

6. The seat should not be flat, but saddle-shaped. Change of position will be desirable.

7. The desks must be easy of access, yet compactly arranged. The angle of vision for the teacher should not be more than  $45^{\circ}$ .

### **Height and Dimensions.**

- (1) The sloping part of the top should be not less than 12 inches in width.
- (2) The inclination should be about 2 inches, and the slope should be about 1 in 10.
- (3) The flat portion of the desk with the groove should be from 3 to  $3\frac{1}{2}$  inches in width.
- (4) The proper height allows the forearm of the seated child to rest horizontally upon it without discomfort.
 

(a) Youngest children	-	-	20" to 25"	to the middle of the slope.
(b) Intermediate children	-	-	22" to 26"	"
(c) Oldest scholars	-	-	30" to 36"	"

The seat should be  $16\frac{1}{2}$  inches high.

- (5) The back rail should be not more than 7 inches for younger children, and not more than 10 inches for the older ones.
- (6) The minimum space for each child should be 20 inches, and 22 inches would be better.
- (7) The width of the gangway should be 18 inches at least.
- (8) The seats should be 8 inches wide.

### **Best Position in the Desk.**

- (1) Sit erect.
- (2) Keep the eyes in a parallel line with the surface of the desk.
- (3) Keep the shoulders at equal heights.
- (4) Keep the elbows close to the side, and not resting upon the desk.
- (5) Weakly and delicate children should have a support for the whole of the back.

### **Schoolroom Decoration.**

**1. Walls.**—These should be clean, and painted a light French grey or pale buff. The lower part should be of wood panelling, or, better still, of dark glazed bricks, so as to form a dado.

**2. Windows.**—There should be an abundance of window-space. Nothing tends to brighten a room like this. The blinds should be well-kept and clean, and the frameworks should be regularly painted.

**3. Pictures.**—Pictures of foreign scenes are interesting and instructive, especially those dealing with primitive forms of life, like the African, the Indian, and the Esquimaux. A few good pictures, copies of our best masters' works, might be added. Historic pic-

tures are very interesting to children, and are all the brighter for being coloured. Pictures of trades, brightly coloured, are also very instructive, and very interesting, whilst a few well-chosen Scripture prints should always find a place.

**4. Maps.**—Picture maps are bright and instructive, preparing the way for the ordinary maps. Of those hanging on the walls, the ordinary ones should be bright-coloured, and should be removed as soon as they become dilapidated or dirty. In such a condition they are little good mentally, and positively bad morally. A few blank maps should be included among the wall decorations.

**5. Diagrams.**—These will include geographical diagrams for the teaching of definitions; astronomical diagrams for lessons on the sun, moon, and stars; botanical diagrams for botany lessons; mechanical diagrams for lessons on mechanics; zoological, for lessons on animals, and so on. The choice of these diagrams will be regulated by the school curriculum.

**6. Honour Board.**—This should form a most appreciated portion of the wall decorations of a school.

#### EXAMINATION QUESTIONS.

- 1.—Write out some of the chief principles to be observed in the lighting and ventilation of schoolrooms.
- 2.—What directions would you give for the daily and weekly cleaning of a school-room? What additional cleaning is needed at longer intervals?
- 3.—What are the objects of school drill? Show that it has an influence upon the character of children and their behaviour out of school.
- 4.—What do you consider to be the uses of a *playground*, and how would you endeavour to make it subservient to the discipline of a school? To what extent (if any) would you take a personal part in the children's play?
- 5.—What kind of desks would you like to find in any schoolroom in which you might have to teach writing? Give the ground of your preference.
- 6.—What sort of objects would you desire to collect in a school museum, and how would you classify them and use them?
- 7.—Describe the proper height and size of desks: (1) for an infant school; and (2) for a school of older children. Say how desks ought to be placed in reference to the light.
- 8.—Give a list of the maps, pictures, diagrams, and apparatus which you think ought to be provided in a well-furnished schoolroom.
- 9.—What sort of decoration is most appropriate in a schoolroom, and most likely to make it bright and attractive to the scholars?
- 10.—What rules should be adopted by a teacher in order to keep the schoolroom perfectly healthy and clean?
- 11.—Describe the best system you know of drill and physical exercise for young children (*a*) in the schoolroom; (*b*) or in the playground; and say what sort of apparatus would be of the most service in such exercises.
- 12.—Describe the most healthful and useful exercises in drill which you have seen, and say how you would conduct them.

*This Chapter is continued in the Appendix.*



## CHAPTER II.

### DISCIPLINE.

**I. What it is.**—Discipline may be regarded as a force for moral training.

**1. It must be based on Natural Principles.**—It must recognise the child's love of activity and curiosity, and it must understand that these and similar impulses may lead the child to do injurious things. It must recognise the weakness of a child's intelligence, which cannot always detect the relation between action and result. It must recognise that character is a growth, and that discipline is the natural trainer and corrector of that growth.

**2. Its Aims must be Good.**—It ought to produce pupils who are not ashamed to confess ignorance by asking a question, and who show a willingness to be taught by any one. Do the scholars take pains with their work? Do they love and seek their work? Is the discipline sufficient to restrain all the unruly impulses of the children? Is it maintained by love or by fear? Does it make a right use of punishments, recognise the inborn idleness of some natures, and seek to remove it? Does it cultivate the amicable sentiments? Does it check and regulate moral precocity, which is always an expensive luxury? Does it make a proper use of the discipline of consequences? Is it consistent, and does it tend to develop a self-governed being? Is it in harmony with the child's nature, and does it possess sufficient flexibility and versatility, which are necessary from an analysis both of children and self?

In so far as it fails in any of these objects, it fails to be good; hence it is not sufficient to say that discipline is the power exercised by the teacher over the children, for that power may be bad.

**II. Ways and Means.**—Discipline must be obtained in one of two ways—by personal influence or by force. "It is better to gain it by force than not to gain it at all" (Fitch).

**1. Material Means.**

- (a) Good physical surroundings are essential. Ill furnished, badly lighted, badly ventilated, dirty, unattractive, or badly planned buildings, limited or insufficient playground accommodation, difficult or inconvenient means of entry and egress to school or classes—all such are impediments to good discipline.
- (b) The dress, manner, voice, and bearing of the teacher should be pleasing.
- (c) A certain formality and dignity should be maintained. It aids the influence of the teacher, and generates a certain amount of advisable awe.
- (d) There should be a due alternation and remission of work. Suitable changes and a fair amount of recreation are great aids.

**2. Mental Means.**

- (a) All duties and offences should be expressed in simple, clear, and precise language. The rules should be few and well understood.
- (b) Offences should be graduated, and for this purpose the teacher must know the principles of punishment.
- (c) There should be efficient organisation, classification, and thorough supervision.
- (d) The reasons for discipline should, as far as possible, be made intelligible to the children. Knowledge breeds confidence, and tends to obedience.
- (e) The methods of teaching used should be carefully studied, so as to produce the maximum gain at a minimum cost of temper and brain.

**3. Moral Means.**

- (a) **Punishment.**—A right use of punishment is very important. Never chide hastily, but correct with gentleness and with evidence of pain. Seek to encourage, rather than to degrade. Have as few restraints as possible, and gradually shift the responsibility from the shoulders of the staff to that of the scholars. With the elder scholars there is nothing like a feeling of responsibility for the production of a healthy discipline, although, at the same time, it must be remembered that this is not recommended for young children. Every teacher possesses more or less tact, and the quality of his discipline will largely depend upon what use he makes of this important talent.

By *tact* is meant a keen observation of what is going on, of everything within the knowledge or experience of the teacher, and a readiness to convert these extraneous incidents into immediate allies. Nor does it finish with a quick and thorough observation. There must also be good and swift discrimination for the exercise of sound judgments.

- (b) **Government.**—Avoid over-government. This is the antithesis of feeble government, and is, perhaps, as much to be condemned. The teacher must remember that authority exists for the benefit of the governed—not for the governors. For this purpose the voluntary dispositions of the children should be trusted as much as possible. A good class opinion should be created, as well as a pride in the moral condition of the school.

**4. Older Children as an Aid to Discipline.**

- (1) By their own *example* they can aid, for imitation is the strongest faculty in children. Admiration and esteem for the elder scholars is generally manifested by the younger ones, and they always evince great pleasure at recognition or notice by the elder ones.
- (2) By *supervision*. The qualities mentioned should be turned to account by the elder scholars to aid in the maintenance of discipline, both out of and in school. They can share the games of the younger ones, or they can control them. They can act as monitors, assist in regulating assembly or dismissal, and generally hold a light controlling hand over their younger schoolfellows.

- (3) *By protection.* They could and should aid to protect the property of the school, the persons of the scholars, and the character and reputation of the school.

**ORDER.**—Order is the groundwork and essential of all method. Just as order is said to be Heaven's first law, so should it be made the first law of life, whether in school or out. Without it efficient instruction is impossible. The best economy of time and force demands a place for everything, and everything to be in its place. There is a time for everything, hence there must be definiteness and an absence of procrastination. Order involves the doing of the right thing in the right way, time, and place by the right person.

**How to get it.**—The teacher should demand order, and then see that he gets it. He must have a perfect control over himself and over the school. He must be quiet in voice and manner, and his voice must be heard as rarely as possible for the efficient discharge of his duties. He must be orderly in his habits, person, and school arrangements. He must be quick of eye and ear, and possess tact, if he is to be something better than a drill sergeant. He must feel and show sympathy with the scholars in their work and play. He must have just and intelligible rules, and these must be uniformly enforced. He must avoid over-government, as it is irritating and wasteful.

There must be regularity in the school movements, and a certain amount of uniformity. Industry must be enforced, and quietness must be ensured—not too much quietness, as it is unnatural to child life, and bespeaks restraint rather than order. The busy hum of an industrious school is no evidence of a lack of order. Orderly methods of work should be demanded and taught, with neat and well-arranged slate and paper work. The children should always be arranged in an orderly manner. The appointment of monitors, curators, etc., will conduce to order, and a good time-table will assist. Finally, the teacher should see that there is good organisation, classification, and careful supervision, with good and comfortable physical surroundings, *i.e.*, a well-warmed, well-lighted, well-ventilated, and well-furnished school.

#### **PARENTAL CO-OPERATION.**

A great deal of importance should be attached to this, and it will pay the teacher to get known among the parents of his pupils. Circumstances may vary, and each teacher may probably be the best judge as to the best means of doing this in his own particular

case. Nevertheless, a few suggestions are here offered for any cases where they may be applicable, and are wanted.

**1. Correspondence.**—A great deal may be done by a judicious letter now and then for special cases; but, as a general method, it would be too expensive in time. It cannot, from staff limitations, be used as a sole means; yet it is a good ally to other means.

**2. Visits.**—These are very productive. On a fixed day each year the parents should be invited to view the ordinary work of the school.

**3. School Entertainments.**—These may take the form of concerts, entertainments, or prize distributions, and they are the best means at the teacher's disposal for securing the object desired. The parents generally like to attend such meetings, and in this way they get to know the teacher, and to be known, in a pleasant manner; both parents and children see the social side of the teacher's character. Experience recommends this method. It is a good investment for the teacher; for discipline becomes easier, attendance better, and parental support more general.

**4. Local Residence.**—To reside among or near the parents is to place one's-self in a favourable position to become known and appreciated. Unfortunately, in many of the large towns, it is scarcely possible for teachers to reside in the locality of their schools.

**5. Local Affairs.**—The teacher can interest himself in local affairs. This will bring him under the notice of the parents; he will be better known, and light goes with knowledge. He will be better treated, better respected, better appreciated as ignorance of him, and perhaps prejudice in some cases, slowly melt away before a growing knowledge of his character. The multifarious associations, classes, societies, etc., in most parishes, will give him ample opportunity. The Local Councils and Corporations will give him an opportunity sometimes of serving his fellow-townsmen in a voluntary capacity, and of forming a powerful circle of friends and supporters.

**6. Local Press.**—Where possible, he should enlist the aid of the local press, which is sure to be read by many of the parents. Report the successes of the school; its meetings, social and otherwise; the performances of distinguished scholars. The interest of the scholars and parents will be aroused, their sympathies enlisted, and their co-operation stimulated.

### AUXILIARY MEANS OF TRAINING..

Besides the usual course of school work, an excellent school seeks by other means to be of service to the children who attend it. Such means would embrace many expedients, among which the following would be included :—

**1. Recreation.**—The establishment of **Athletic Clubs**, such as football, cricket, and swimming, is now very general. A **Ramblers' Club** affords pleasure and profit if the teacher knows some Natural History. In each case the teacher should support the club by his presence. The manly and useful qualities, so well inculcated by our English games, when properly played, are among the most valuable results of our educative system. **Concerts** have already been referred to. The establishment of a **School Library** would supply another healthy and educative source of recreation, and would help to form that love for sound literature which is such a blessing in after life.

**2. Assistance.**—Thrift might be encouraged by the adoption of **Penny Banks**. The teacher might also seek to cultivate influence with neighbouring employers, so as to help to **place some of the boys** when leaving school. Other means of assisting will probably present themselves. Locality may afford or deny advantages of this sort, but where the teacher shows practically that he is concerned about the future welfare of his scholars, his influence will be none the less, and his success will be all the greater. In the poorest districts, the practical interest shown by the teachers in the **penny, half-penny, and free dinners**, and their appeals for cast-off **clothing**, is splendid evidence of the missionary spirit which many of them bring to bear upon their work.

### PUNISHMENT.

**I. Its Limits.**—The subject of punishments is the most difficult and the most vexed in school management. There is a great and striking diversity of opinion on the subject. The teacher must remember that all punishment is suffering, and, as such, is an evil. Hence it should only be inflicted when necessary; and since it is intended to supply a counteracting force, weak punishments may be the worst of punishments. A pupil should never be punished at the moment of offence; never when he is not expecting it; and for serious cases, always in private. The teacher should always look for the motive, as it is that which has to be checked; and **only punish when that motive is a bad one.** To punish judiciously

and profitably much experience is required. Young teachers have not this experience, hence if they punish at all they should begin with light punishments. Unjust punishments are injurious morally, mentally, and physically. They breed bad feeling between teacher and class; they check the activities of the child, and often place the teacher in a dangerous and uncomfortable position. Hence seek to limit them as much as possible.

**II. Cases for no Punishment.**—These, as laid down by Bentham, are:—

1. **Where it is Groundless.**—These would include such cases as these:—

- (a) Where there has been no real mischief.
- (b) Where the mischief is outweighed by a greater benefit.

2. **Where it is Inefficacious.**—Such cases exist when:—

- (a) The penalty has not come under the child's notice.
- (b) Or, when he is unaware of the consequences of his act.
- (c) Or, when he is not a free agent.

3. **Where it is Unprofitable.**—This includes cases where the evil of the punishment exceeds the evil of the offence; or when it is likely to be useless through a weak will. The teacher must know what these evils are to measure them. Such evils of punishment would include:—

- (a) Coercion or restraint.
- (b) The uneasiness of apprehension.
- (c) The actual suffering.
- (d) The suffering caused to sympathisers with the sufferers.

4. **Where it is Needless.**—It is needless when the end can be obtained in some other way; as by instruction, persuasion, etc. Such cases would include obstreperousness in boys, some forms of crying, and cases in which the discipline of consequences avails.

**III. The Amount of Punishment.**—The amount of punishment will be a varying quantity, but whether much or little, it should always be such as will be most likely to deter from any repetition of the offence. Some of these are worse than others, and demand a greater punishment; *e.g.*, truancy and untruth should be punished more severely than simple truancy. The same punishment for the same offence in all cases alike would be unfair, for it makes no allowance for age, constitution, position in the school, etc., and ignores the individuality of the child. Then the less certain a punishment, or the longer it is delayed, the greater it should be, for penalties that are uncertain or remote fail to influence the child's mind. Sometimes a punishment may be well suited in quality, but it only exists in one absolute quantity. Nevertheless, it may be advisable to employ it, although it may be a little beyond the measure of the offence; *e.g.*, Expulsion, Dismissal from Office, etc., and this may be the case more particularly when the punishment constitutes a moral lesson. In any case, if the punishment is more likely to do harm than good, it should be omitted.

**IV. Selection of Punishment.**—In selecting a punishment, so far as is possible, the teacher should try to fit it to the offence.

If the punishment is well fitted to the offence, the child begins to see that some offences carry more suffering than others, and so soon learns that there are degrees of guilt. The selection having been made the infliction of the punishment should be made as impressive as possible in its application, so as to afford an example to others. Again, where possible, the punishment should be so selected as to tend to reform by weakening the seductive and by strengthening the preserving motives, as in giving a habit of industry to the idle. The punishment selected may sometimes need to embrace and enforce compensation, as in making a child pay for damage to school property, and in the making up of neglected lessons. Then the punishment should be so chosen, where possible, that it could be remitted in case of mistake. Punishments like Corporal Punishment, Detention, etc., are inapplicable in such cases, but Deprivation of Marks, Deposition from Office and other like punishments would be available. But whatever the punishment selected may be, it should be well within the child's understanding, and such as will gain the sympathy and support of the school; otherwise it is weak and badly chosen.

#### **V. Kinds of Punishment.**

**1. Blame.**—All forms of censure may be used, because they are a good and ready method. But the teacher should be sparing of it. Righteous and controlled indignation is a powerful weapon, which should be reserved for special occasions.

**2. Shame.**—Appeals should be made to the sense of shame. It is powerful with many, but not all. It depends for its value on the sensitiveness of the pupil, and class opinion. It is not suited to great offences, and so generally is useful only for first offenders. Iteration weakens it.

**3. Detention.**—The stopping of play and loss of liberty are very irritating to children. Hence detention should be used for great and habit offences like riotous behaviour and unpunctuality. Bain thinks it a bad form of punishment.

**4. Pleasure.**—The deprivation of some object of pleasure is a good form of punishment where applicable. There is another application of this punishment which is recommended by Locke. Take the offence itself and dose the offender until he is salted with it.

**5. Impositions.**—Here the pain lies in the weariness produced. There is also the irksomeness of confinement. They might be used for neglect of lessons, for unpunctuality, and for disobedience. But there is a strong division of opinion about their value. It is asserted, with some truth, that they create a distaste for school work, and so while checking one evil they produce another. By some they are even considered barbarous.

**6. Marks.**—The giving of bad marks may be useful, especially if it is possible to erase them by subsequent good conduct.

**7. Corporal Punishment.**—See Section VII.

**8. Expulsion.**—This should be a last resource. Its failing is that it is not always available in an elementary school.

**VI. Objectionable Forms of Punishment.**—Such punishments as a box on the ear, blows on the head or face, pulling the hair, pinching the ears, rapping knuckles, standing on one leg, crucifixion (standing with extended arms), impositions (according to some people), should all be strictly avoided. The dark room and the cupboard are barbarous and dangerous punishments. The fool's cap, the label, or the sandwich boards degrade the pupil in the estimation of his fellows, and often harden the culprit himself.

**VII. Corporal Punishment.**—This is the most vexing form of this most vexed question of school management. Opinions on it are so conflicting, that any pronounced opinion is sure to offend some people. But our best educational authorities consider there are times when it is necessary, and when it would be a mistake not to use it.

**Objections to Corporal Punishment.**—John Locke gives the following objections to its use:—

- (1) There is in us a natural propensity to indulge in corporeal and present pleasure. This wants rooting out. But corporal punishment strengthens the propensity by appealing to it. A child who abstains from any act through fear of corporal punishment only prefers a greater corporeal pleasure, or avoids a greater corporeal pain.
- (2) By association, it breeds aversion to that for which it is the teacher's business to create a liking.
- (3) It is a slavish discipline, and makes a slavish temper.
- (4) It often—in severe cases—brings a worse and more dangerous disease, by *breaking the mind*. Instead of a disorderly boy you get a low-spirited, moping boy.

**VIII. Young Teachers and Corporal Punishment.**—Young teachers should be restricted from the use of corporal punishment, both for their own sake, and for the sake of their scholars.

For the Scholar's Sake.	For the Teacher's Sake.
<ol style="list-style-type: none"> <li>1. The infliction of corporal punishment is the most difficult and the most unpleasant part of a teacher's work; and, therefore, for the sake of the scholars, it ought to be inflicted only by those presumably most fit to do this delicate work.</li> <li>2. Scholars are more ready to admit its justice from an older or principal teacher.</li> <li>3. There is apt to be in young teachers.               <ol style="list-style-type: none"> <li>(a) More zeal than discretion;</li> <li>(b) More feeling than judgment;</li> <li>(c) More energy than sympathy;</li> </ol>               and, as a result, the children may be punished unjustly.             </li> <li>4. It tends to harden and demoralise, and not to elevate.</li> <li>5. It checks the will without disciplining it, and so makes the scholar less fit for work.</li> </ol>	<ol style="list-style-type: none"> <li>1. The work is so unpleasant that young teachers should rather avoid than seek it.</li> <li>2. Generally, it is against the opinion of Local Councils, the public, the parents, the press, and the magistrates; and an antagonism to so many authorities, and its consequent risks, is too big a price to pay for the authority in question.</li> <li>3. It breeds bad feeling between pupils and teachers, and so discounts the efficiency of the work.</li> <li>4. It often breeds insubordination when inflicted by a young teacher.</li> <li>5. Punishment, for the most part, is negative in its effects. It weakens vital force, and so discounts work. It deters rather than excites to activity.</li> </ol>



**REWARDS.**

**I. Principles underlying their Use.**—1. A child should do its lessons and behave itself properly from a sense of duty; but, unfortunately, the sense of duty is weak in a child, and has to be cultivated. For the adequate accomplishment of our duty a moral impulse is at least occasionally necessary. But a moral impulse involves a moral sense, and here again we find children lacking. The cultivation of a proper moral sense is the great aim of school education on its moral side, and this is the work of years. Then, as the motives are weak, some inducements to right conduct must be held out to children: hence the necessity for rewards. The natural appetite of a healthy child is for play, and as all work cannot be made play, then rewards become necessary as an inducement.

2. But the proper bestowal of rewards involves the exercise of wisdom and justice. When to bestow them, why they are bestowed, and the amount to be bestowed, are three problems difficult to solve in some cases. Their moral effect must not be wasted or lost. The ground on which they are given is all-important. Effort and industry should be encouraged rather than intellectual ability; moral work, rather than mental merit.

3. Rewards should not be too freely bestowed in the early stages of child life, for that is the period for developing the social sentiments, and emulation or rivalry is an anti-social emotion.

**II. Rewards as Inducements to Work.**—1.—They are an incentive to work, because they appeal to the *love of gain*, the love of approbation, the love of power, and *kindred emotions*. The risk attached to them is that they are apt to be looked upon as an end rather than as means.

2. They are a means of interesting the *parents* in the progress of their children.

3. They incite to *obedience*, and so strengthen the formation of *good habits*.

4. They often raise the successful pupils in their own and the estimation of the other pupils. They thus breed *respect*, which may be valued more than the reward itself.

5. They set up a pleasant and profitable *association* between industry and the best form of rewards.

6. They make a powerful appeal to *emulation*; and the desire of surpassing others, of gaining distinction, of acquiring fame, is the most powerful known stimulant to intellectual work.

7. Rewards bestow *pleasure*, and pleasure is one of the most powerful of motives.

8. Rewards are *positive* in their effects; punishments are negative: hence they are a better weapon than punishments.

### III. School Rewards.

1. **Place Taking.**—This appeals powerfully to emulation.

2. **Decorations.**—These are of a simple character.

3. **School Privileges.**—These include such things as the right to occupy certain places, to fill certain *offices* like that of *monitors*, *curators*, *librarians* of the school library, the marking of certain forms of school work, etc.

4. **Prizes.**—These can take the form of *books*, *certificates*, *medals*, and *scholarships*. Their effect varies. They often stimulate rivalry, which is an anti-social feeling; or they may call forth the best of the social emotions—love for parents, respect or love for the teacher, and the consequent desire to give the loved or respected ones pleasure by the gaining of a prize. They often have a wider effect. There is the bitter feeling of disappointment in the less successful scholars, which may harden into indifference and a subsequent lack of effort, or there is the arousing of jealousies, envy, and a sense of injustice. A failure, rightly utilised, should become a further stimulus to success.

5. **Esteem, Praise.**—These are very powerful incentives to the mind, but they must be used judiciously to be effective. A pleasant association grows up between right conduct and praise; and later, the right conduct becomes a habit, and sufficiently strong to exist independently of the association.

### GOOD MANNERS.

Good manners are a matter of breeding or habit, hence any efforts in the direction of good manners must go through habit. If home influences are antagonistic, the task is rendered more difficult; but this difficulty ought to stimulate to greater effort.

1. **Imitation.**—The imitative faculty is strong in children, hence the teacher should always be well mannered before his pupils. He should see that they are well mannered to him and to each other, and both should be well mannered to visitors and officials, and in their private life. The better mannered boys might be held up as an example to the rest. This could be done in many ways without obtruding such pupils directly on the notice of their fellows.

2. **Their Importance.**—The teacher should make his class thoroughly understand the importance he attaches to good manners. There is a tendency too often to think too much of intellectual excellence, and to take excellence in bearing as a matter of course. If the class once understands that the teacher attaches as much importance to good manners as to good scholarship, the improvement will be rapid and wide.

3. **Rewards.**—These should be given for conduct as well as for ability. Good manners form a large element in conduct, and their cultivation will thus be encouraged. Rewards should not only go to the clever. Remember that education is moral as well as mental.

4. **Good Company.**—This is another opportunity for imitation. Take the children into good company whenever possible. Let them mingle with and see the manners of better bred people than themselves.

5. **Self Respect.**—Inculcate a feeling of proper self-respect. Do not let there be too much humility, or hypocrisy or bashfulness will be the result, and both are ill-bred. But encourage such a feeling as will prevent any slight or disrespect in their manner to any one. A person who respects himself usually shows some respect to other people.

6. **Cultivate their Dispositions.**—Quickly and continuously cultivate their dispositions, seeking to produce such a disposition as will make them very

reluctant to offend any one ; and then aid them to show that disposition in the most agreeable way possible. In this way they will gradually become quiet and refined in their general bearing. Especially will a well-bred person seek to avoid making any one uneasy in conversation.

**7. Good Literature.**—Place good literature in their way. Let them read of cultured and refined people ; imbibe cultured and refined thoughts ; and the mellowing influence of such agencies, though probably slow in operation, will certainly bear fruit by improving their manners.

## ANGER.

**I. Causes.**—Anger may be aroused by any number of specific causes, such as an injury, real or supposed ; unfair or capricious treatment, unnatural restraints of discipline, physical pain, spite, envy, or jealousy. But all these specific causes range themselves easily under one generic head—*the sense of injury*.

**II. Treatment.**—Its treatment is difficult. The angry child is both physically and mentally disturbed. If the anger is excessive, the action of the heart is impeded, and the face turns pale. The digestive and other functions naturally suffer from the withdrawal of blood and nervous power. Or the excessive activity of the system engendered by anger may cause the face to redden, the veins to distend, and the action of the heart to quicken. This rousing of activity is characteristic of rage, and the child is in a very excitable condition altogether.

The child is equally disturbed mentally. There is a shock of pain which discomposes the system ; a deep rankling pain, which wants to retaliate ; a state of feeling, which turns the pain to joy if the retaliation is successfully effected.

A little knowledge of this sort shows the teacher the difficulty of his task. The child is in no fit state for argument or punishment. The first effort must be to soothe the child, and to restore him to something like a normal physical and mental condition. This will depend largely upon the temperament of the child, and the nature of the provocation. An unintended injury is easily satisfied, but injury done designedly is not so easily removed.

- (1) Bearing these facts in mind *at a subsequent period*, when anger has decreased or disappeared, the teacher might make some effort to strengthen the child against any similar outbreak. If any *immediate action* is taken at all, it should take one of two forms :—
  - (1) The voluntary self-humiliation of the wrongdoer.
  - (2) A compulsory humiliation inflicted upon the wrongdoer. Bain assures us that both of these are found to answer their end.
- (2) Later on the teacher might point out the dreadful effects of anger. He might show how it exhausts the energy ; gives pain and annoyance to others ; makes enemies ; and brings dislike and distrust. Angry people are wisely shunned.
- (3) He should appeal to the class to *bear and forbear* ; to avoid anything likely to provoke to anger.

- (4) He should seek to cultivate the *reflective powers* of the child, and this will give him a healthier view of the irritating causes.
- (5) Where possible he should trust to the *discipline of consequences*, for anger often brings its own punishment.
- (6) Where it leads to acts of *deliberate cruelty* it must be checked, even at the expense of considerable severity.
- (7) He should *appeal to the child's will*, and make him understand that he should be the master, not the slave of his passions. He might also gently remind him that public opinion considers anger to be short madness.
- (8) Perhaps the best method of all will be to *cultivate the social feelings*; to appeal to the higher side of the child's nature.

### OBSTINACY.

This is a fearful fault of temper in children, and one especially hard to deal with. Its treatment should depend upon its cause, and will often differ. Its detection is not always easy, for there may be states of mind which may be mistaken for it. We will first of all deal with those.

#### I. Mistaken Obstnacy

1. **Stupidity.**—This is often mistaken for obstnacy by inexperienced or careless teachers. The natural obtuseness which keeps a child dumb when questioned, the lack of intellect which handicaps him in the right interpretation of work and rule, and often the consciousness of his own stupidity, are factors giving a product which wears the garb of obstnacy.

2. **Physical Weakness.**—This may not allow a child the necessary strength or energy for the proper performance of school duties. There is a shrinking from the censure expected or received; a sort of passive suffering, lacking the necessary strength-fed courage. But it is not obstnacy. It is not a fault of temper, but of constitution.

3. **Fear.**—Here the pupil will be in an extreme state of misery and depression. All the activities are prostrated, and as a result the child will be afflicted with exaggerated ideas in all matters associated with this emotion. Remember the pain of fear is double, the present pain being augmented by a prospect of future pain, increased by uncertainty. It is a most destructive feeling. It wastes the energy of the child and scatters his thoughts, and consequently it is a great hindrance to progress. Generally it paralyses effort, and this is mistaken for obstnacy.

**Treatment.**—In all these cases there is no voluntary resistance, but constitutional defects, and punishment is unwise and unjust. The child does not require correction, but assistance; not severity, but sympathetic patience.

#### II. Real Obstnacy.—This may originate in several ways.

1. **The Teacher.**—Harshness in manner and treatment; a querulous nature with its chronic fault-finding; the sneer, sarcasm, or other mode of irritating language; demanding too much of the pupil, and meeting failure with punishment—all these are provocative of real obstnacy.

2. **Fitful Obstnacy.**—Here the obstnacy is a fluctuating and uncertain quantity. Its cause may be any of those specified, but its uncertainty is its chief characteristic. Wounded vanity is often the guilty agent.

3. **Vicious Obstnacy.**—This is a bad fault of temper, and is generally indicative of a low moral tone, or of a strong development of the anti-social emotions. The pupil deliberately defies authority, makes himself a nuisance, and often becomes a force by the mere nature of his objectionableness.

#### **Treatment.**

- (a) Here the fault lies with the teacher, and the remedy also. Let him improve himself, and the evil will disappear.

- (b) In the second case an effort must be made to turn the sympathy of the class against the boy. This being done, the boy is attacked in his most vulnerable point. In extreme cases, separation from his school-fellows or expulsion may be used.
- (c) There is some division of opinion among our best authorities as to the proper treatment in the third case, but there are certain recommendations common to all.
- (1) Do not let the boy think you mistrust him.
  - (2) The teacher must be firm, unruffled, and reasonable. No personal motive must be present.
  - (3) Avoid a contest with the boy if possible, but if you enter upon it you *must* win.
  - (4) Enlist the sympathies of his fellows against him.
  - (5) Most authorities consider this a fit case for corporal punishment, but only use it in extreme cases. Separation and reflection may render it unnecessary.
  - (6) Victory must be followed by gravity and kindness
  - (7) Incurable cases must be expelled.

**CRYING.**—According to Locke, there are two kinds of crying:—

**1. Stubborn and Domineering.**—This kind of crying is a striving for mastery. Children want their own way, and as they have not the power to obtain their desire, they will by their clamour and sobbing maintain their right to cry. If you permit this kind of crying, you merely encourage the child's unreasonable desires.

Try persuasion at first, or divert their attention, or give them a little good-humoured banter. But the circumstances of the case and the child's temper must be considered. If these fail, use severity; for where a look or command will not do it, corporal punishment must, for it is nothing but obstinacy. The will must be bent, for there the fault lies. It may involve a contest, and, unless the crying is stopped, or its nature changed, then the whipping has been useless. Hence each case must be guided by its own circumstances.

**2. Sorrow or Pain.**—This kind of crying can be easily distinguished from the former. Crying is the first and natural way for children to declare their sufferings or wants; and this needs to be remembered, especially in infant departments. But where it is passing into a habit it should be stopped. Gentle means will suffice. Children should be taught to bear physical pain or disappointment without crying. When they suffer little knocks and bruises through heedlessness, it is not pity they want but caution. Locke even suggests that we should bid them do it again. His great idea is to harden children. He says they should have no tenderness but what rises from an ingenuous shame and a quick sense of reputation.

## **CRUELTY.**

**1. Natural Tendency.**—There is a natural tendency in some children to cruelty. The sympathies and affections of children are often but little developed in character, and where the contrary passions are unusually strong, pure malevolence bestows intense pleasure. Cruelty may arise from thoughtlessness or ignorance, as when a boy tortures a fly; but every teacher of any experience knows that there are natures prone to voluntary cruelty. The character is often illustrated in literature—the Quilp of Dickens being a well-known instance. The anti-social feelings are strong in children, and cruelty is a development arising from them. A child is fond of domineering. The checking of this arouses antagonism. He resents injuries, real or supposed, and shows his resentment by striking other children. Nor is cruelty confined to physical pain only. We are early taught to hurt nobody by *word* or deed. The tongue, and a line of conduct painful to those who love us, are other familiar instances.

Cruel children may make cruel adults, hence cruelty should always be checked. Neither teacher nor scholar can afford to be cruel, for cruelty is

hated with a fearful hatred. Children should be bred up in abhorrence of cruelty, and taught that nothing should be spoiled or destroyed but for the sake of something better.

**2. Habit and Custom.**—These often engender cruelty. Harsh laws, whether in the home or school, do this. Many foolish parents whip their children for everything. Some teachers are too prone to the use of the cane. The teacher, by his own example, and by a kind and judicious rule, can do something to check this.

**3. History.**—There is often a large element of fighting and killing in history. Honour and renown fall more readily upon conquerors than upon others. The press and literature of the country sometimes aid in the same way. As a check to this the teacher should make a wise selection of reading matter, and his history lessons might be regulated for the same purpose.

**4. Games.**—Some of our games which, rightly played and under a right discipline, are checks to cruelty, may be, and often are, abused instead of used. They may become mere channels for cruelty. Games must be encouraged, but the teacher must strive to regulate and discipline them.

**5. Animals.**—Cruelty often shows itself in the treatment of animals. A few natural history lessons, given with kindness as an aim, would check this. To cure cruelty is difficult, and often slow. Fighting, fagging, bullying, and tyrannising are common school forms of it. A hatred for all forms must be implanted. Sound principles of religion and morality will aid to check it, and the teacher must practise kindness both in word and deed.

**6. Harshness.**—"As is the teacher such is the child," is a scholastic truism within reasonable limits. The plastic nature of children is easily moulded for good or evil. Perhaps the teacher's character is the greatest influence bearing upon the children in this respect. It is useless to preach kindness and practise harshness. If children are to grow up with happy and cheerful tempers, then one important essential is that the teacher should be of a happy and cheerful temperament. Harshness is often the attendant of impatience. But a teacher must be patient, because the best results of his work are slow to show themselves. A bad temper is a source of perpetual irritation and misery in school. "A boy compelled for  $5\frac{1}{2}$  hours a day to see the countenance and hear the voice of a fretful, unkind, hard, or passionate man, is placed in a school of vice" (Fitch).

## KINDNESS.

**1. Its Scope.**—Kindness is another name for benevolence, and some authorities assert that benevolence includes all the virtues. The ideal to aim at is to love your neighbour as yourself. It includes an internal factor—the cultivation of the affections in oneself; and an external factor—the promotion of happiness in others.

**2. Its Cultivation.**—The teacher must practise benevolence. He must do deeds of kindness, for affection is shown in good actions. He must also teach the children to show kindness to each other. His discipline must be gentle, firm, considerate, and even generous. He must nevertheless be just before being generous, for the special function of kindness only begins where justice ends. The pupil should also be taught that he owes slight services to his fellows; *i.e.*, he should be "obliging". Any little service which can be done without inconvenience may be mutually demanded. Finally, he should cultivate sympathy, which is something more than general benevolence.

## COWARDICE.

Cowardice is one of the results of fear, and it has in it an element of meanness. It produces a general depression of tone; and mental depression, however arising, is exaggerated distrust of good and anticipation of evil. The susceptibility to fear in the

young, to a certain extent, may be a nervous property; but the teacher must remember that there are certain temperaments, like the passive and susceptible, which are prone to it. Its cure should be sought through its *causes*. An effort should be made to discover these and to remove them.

**1. Frights.**—Keep the children free from all kinds of frights. Bogey stories, ghosts, etc., should be abstained from by those who have to deal with young children. A fright may leave a permanent injurious effect. Punishments, especially when they are excessive or capricious, often produce frights. Shutting children in cupboards, and locking them in dark rooms, are also some causes of frights. Violent threats and outbursts of temper are others. Avoid all.

**2. Ignorance.**—This is a fertile source of fear, and is very productive of cowardice in weak minds. Knowledge is the remedy. Perhaps no grander result is accruing from the general teaching of science than the disappearance day by day of those bits of superstition which often terrified the people and fed a feeling of cowardice. Uncertainty is a species of ignorance, and is thus sometimes productive of fear or cowardice. Here the teacher should try to work through its counteractive, and to cultivate a feeling of composure or coolness in the presence of danger, real or fancied. The pupils should be taught to get a measured estimate of the danger, and then to make a sufficient effort to overcome it.

**3. Ill-Health.**—Cowardice may frequently arise from a weak body, and here it might more justly be called something else. Such cases require kindness, sympathy, and forbearance. The best remedies are beyond the teacher's reach, for they include good or improved conditions of life. But a certain amount of familiarity with, and a knowledge of the objects feared may be beneficial.

**4. Association.**—Cowardice may arise by association. To check or cure it, form new associations of a stronger and conflicting character. Divert their thoughts, and mix pleasant things with the diversion.

**5. Moral Cowardice.**—Here the moral sense is weak, and needs cultivation. The higher emotions must be developed, and this will be a slow process. There is a weakness of motive, both in duty and in prudence. The cure is to give the child new motives. Withhold him from all strong temptations. It often arises also from weak intellect. "Please, sir, I couldn't help it," is a common excuse; and here the pupil pleads his moral weakness in extenuation of his offence. Some punishment must be given, so that he may act differently when the same conditions again arise.

**6. Heredity.**—A family, like a nation, may be cowardly by nature. The process of cure is perhaps the hardest and slowest of all.

## OBEDIENCE.

There can be no school without government, and no government without obedience. Obedience is a habit, and an important one both for the individual and the State. It is not easy in its first stages with some children, as it involves the submission of their own will to that of another. The child has to learn to control its own will, and this control is a resultant of several components. It has to learn to respond to the word of command, to imitate movements at sight, to act on a wish. There are several kinds of obedience, the best of which is cheerful and willing. The motives are the index of the kind,

**1. Slave Obedience.**—This is such obedience as a slave gives to a master; a dog to a whip; a horse to a spur; a child to the cane. The motive is weak, for it generally springs from a hope of favours to come, or from fear of some punishment. It manufactures a fair proportion of hypocrites.

**2. Military Obedience.**—This is the obedience of habit. There is no why or wherefore offered. The obedience is demanded, and it has to be given. It is a prompt species of obedience, brought about by a perfection of drill. Repetition fixes it. There is no cruelty necessarily attached to it; no fear. It is a matter of habit pure and simple, such as one sees in the army, navy, and certain schools. It is pleasing to look at because of its smartness, and is apt to impress the martinet official favourably. It is always mechanical, and generally unsympathetic. Its failing is that it leaves the character weak, and the child is launched into the world subject to all the dangers which threaten a weak will.

**3. Cheerful Obedience.**—This implies respect on the part of the pupils for the teacher, and it is obtained by a skilful use of natural principles. *Affection* is called to aid, for a child obeys willingly where it loves. Then, in a kind manner, it takes advantage of the *sense of dependence* in children, which arises from their ignorance and weakness. These failings produce a disposition to obey which the teacher skilfully uses. It also recognises the force of *sympathy*. Children are very much like sheep in this respect, for one does pretty much the same as all the others. Hence, a word of command, since it appeals to the majority, appeals to all, and so we find the will freely submitted to the authority of others without becoming weak. The will is in harmony with right, and an association has been set up which shows that the obedience springs from virtue, and not from habit only, or from fear. *Authority* is invoked, for the teacher is *in loco parentis*, and must prove himself as much the friend of the scholar as the parent. The obedience is claimed on the ground that it is right to yield it.

The *personal equation* is also a great aid. By this is meant an aggregate of qualities and habits (qualities mental and moral) possessed by the teacher, and differing in quantity or quality, or both, in most teachers. It is a characteristic attribute which obtains for some men the title of "born to command," and among teachers the reputation of being "a born teacher".

A healthy *school opinion* is another great aid to cheerful obedience, and the teacher should cultivate it. If the school rules are just, the children will sympathise with them, and the co-operation of the parents will be ensured. The reputation of the school should be placed in the hands of the scholars, and their pride and sense of responsibility will be thereby increased. Their respect will thus be obtained, and prompt and cheerful obedience will be the result. *School games* might also be made an auxiliary for this purpose. They afford the teacher many excellent opportunities of establishing that relation between him and the scholars which is so much desired. The efficacy of *rewards and punishments* as tending towards the same end has already been shown.

## INATTENTION.

Inattention is often the fault of the teacher, and especially of young teachers. To fix and maintain the attention there are certain laws of the mind which must be obeyed, and any violation of these laws is sure to be followed by more or less inattention. There is no guiding the young without the power of concentration.

### Conditions of Attention.

**1. The Will.**—The will is the chief influence, and the chief stimuli of the will are pleasure and pain. But it must be remembered that the will itself is a growth, so that the voluntary attention of a child may not be great. Concentration is weak in children.



**2. Pleasurable.**—The teaching must be made pleasurable by the use of natural methods and by a pleasing manner. Pleasure supports the cause that brings it, and so the whole strength of the mind is ensured. Do not make the pleasure too great, or it will defeat its own object. *Novelty* is an aid.

**3. Physical Conditions.**—See that the physical or material surroundings of the children are comfortable; that they are well seated, out of draughts, glare, etc. Mental concentration can hardly be expected where there is physical discomfort.

**4. Suitability of Work.**—The work should be suitable. It must be within the compass of the children, and adapted to their growing powers and likings. The lesson should make use of child activity, observation, and curiosity. With older scholars the higher faculties should be worked.

**5. Assistance.**—A fair amount of assistance should always be given, and the child's mind should not be kept bent too long upon the same subject. You may force the attention, but it is wearying and unprofitable. There should be proper changes of work. The physical should follow the mental; or the mechanical might dovetail the mental. Singing, drill, and writing are good changes following on the heavier lessons like arithmetic and grammar.

**6. Obstacles.**—Remove all distractions, such as sitting near an open window overlooking a street, or the proximity of some class at a noisy lesson, interruptions, outbursts of temper or disorder, and all kindred obstacles.

**7. Punishment.**—An injudicious use of punishment is a great hindrance to the maintenance of real attention. The child is thrown into a strong and antagonistic emotional state. In a depressed and subdued child the appearance of attention is not worth much.

## **LAZINESS.**

Relatively, few people in this climate are lazy, for climatic influences are against idleness. Public opinion condemns it, and necessity conflicts with it. The supposedly idle work, and some of them very hard. But laziness is used here in a limited sense. It is the refusal to perform, or the ill-performed task, which is called idleness. Of course, every teacher will meet with a few exceptional cases, where the children are "bone" lazy, and often some physical or constitutional cause will be found for this. The treatment of laziness will vary with its origin.

### **I. Constitutional Laziness.**

**1. Health.**—This may be the result of weak or delicate health, and in such cases it should be kindly dealt with. The tasks are too much for the pupil, and should be lightened.

**2. Teacher.**—It may spring from the teacher. Ignorance or indifference to the elementary principles of child life will generate laziness. There must be a natural application of the force which nature has supplied—child activity. If the task set does not make much demand upon this activity, there is a tendency to despise and reject it.

**3. Natural Aptitudes.**—The same may be said of the neglect of natural aptitudes. They are strong in children, and need careful regulation. The child will neglect the set task to indulge in his beloved pursuit. Watch him, see what it is, and give him a surfeit of it. This is Locke's recommendation. Keep him hard at work on something, so as to form the *habit* of industry—the something of his choice which has proved the disturbing factor. He will weary of it, and return to his set task with relief.

**II. Habit Laziness.**—An indolent disposition is not always the result of constitutional weakness. It may also be formed by

habit, and the habit must be checked before it passes beyond treatment. It is easier to bend the pliant twig than the hardened stem.

**1. Kindness.**—A little kind conversation may be sufficient. The boy may respond to the interest thus kindly shown in him. The desire to please a kind teacher may prove a stronger motive than the desire to idle. His self-regard should also be appealed to. He should be made to understand that *he* is the actual loser by his idleness, by pointing out his present and prospective losses. The prospective losses are generally too distant in time to appeal to children, but their conjunction may strengthen the appeal to his present losses.

**2. Shame.**—If kindness fails, then try a little good-natured banter. Let there be no feeling or vindictiveness in your tone or manner, but let the child understand that he has sunk in your estimation and that of the class.

**3. Punishment.**—This should be used with care, for it is fatal to success to set up unpleasant associations. Neglected work may be done in playtime, or impositions may be given where they can be done honestly, and without making much demand upon the teacher's own time. Only in such cases as those in which it assumes an obstinate form should corporal punishment be used, and it may be said of punishment generally that it is often expensive and deceptive in cases of idleness.

**STUPIDITY.**—This may be a gift from the parents or the teacher.

**1. When Bestowed by the Parents.**—When nature is responsible there is nothing for it but patience and kindness. The ordinary school curriculum does not suit such children, nor should they be placed under it. The London School Board has humanely recognised this fact by providing a special curriculum and central classes for such children. The school and its work want to be made especially attractive, and the teaching requires to be very largely composed of kindergarten, hand and eye training, and simple object lessons. Under no conditions should these children be forced, for the intellectual wealth of a country lies in the cultivation of its ability, and not in the forcing of its mediocrity.

**2. When bestowed by the Teacher.**—The child may be *badly classified*, and this may breed stupidity from lack of apprehension. The teacher may be *unmethodical*, or *not properly acquainted with his subject*. He may be *careless* or *inaccurate* in describing or informing, or in the correction of exercises. Or there may be a *lack of illustration and experiment*. He may be *harsh* or *cruel* in his manner, and so chill or freeze the efforts of the timid, the weak, or the shy. His *questions* may be badly framed, badly put, and put at the wrong time, and there may be no skill in dealing with the *answers* given. And generally there may be too much ignorance of the elementary laws of the mind to deal with its training efficiently.

### TRUTHFULNESS.

This is a wide term, including as it does not only accuracy in obtaining and stating facts, but sincerity, candour, ingenuousness, uprightness, respect for the property of others and for their own; honesty in speech and time, as well as in money or goods. Lying will sometimes supplant it, and it must be the constant effort of the teacher to check the one and to cultivate the other. To grapple with untruth, seek out its causes, and deal with them.

**1. Causes of Untruth.**—These may be various.

1. **Cowardice** (fear).—There may be a desire to evade some punishment, to shirk some pain. It is a ready and apparently cheap cover for any fault.

2. **Gain**.—It may be to secure some gain, to favour some cheating transaction, to remove some obstacle, to win some contest.

3. **Weakness**.—It may spring from weakness, either physical, mental, or moral. The physical weakling may fear physical pain; the moral weakling may be the product of surrounding circumstances; the mental weakling is a species of fool, and is generally to be pitied.

4. **Vanity**.—With older pupils it may arise from vanity. A lively and fertile imagination is drawn upon for facts to establish the fame of the offender for some point of excellence. There is such an overweening opinion of self, such unbounded belief in one's own worth and capacity, that the fancied potentialities of the individual are dished up as actual occurrences. But in such cases memory is generally weaker than imagination, and these flights of fancy are sure to stand self-revealed sooner or later.

5. **Malevolence**.—There may be a desire for revenge; to hurt by word; to break the ninth commandment, so that they may break the eighth.

**II. Treatment.**—The teacher must look beyond the act itself, and deal with the *motive*. He should aim to implant the principles of honesty in the disposition, rather than to prohibit certain acts. He should on the first occasion seem *surprised*, and gently reprove with an appearance of sorrow. If this be insufficient, *rebuke* the child, and show yourself very much displeased. There should be a *removal of confidence*, which should only be gradually restored after penitence has proved its genuineness by rigid truthfulness. The *penalties* attaching to lying should be placed before the child. People shun, distrust, and despise a liar. No one will knowingly employ him, and no good people will willingly associate with him. *Shame* and *contempt* can and should be shown if necessary. Lying should always be spoken of with detestation, as a quality totally inconsistent with the character of an honest man. The *religious* aspect of the question must be pointed out and enforced—the Bible is fertile in punishments following on this vice. The *social necessity for truth* should be explained, to the older scholars at least. The whole fabric of society and the credit of nations depend upon the sentiment of truth. Finally, the teacher's own *example* must be all that is demanded of the pupils, or they will readily see that he is seeking to force a commodity upon them which finds no favour with himself.

**Honesty**.—This is a wider term than truthfulness. It will include all that is there expressed, and something more. It will embrace the full teachings of the eighth and ninth commandments. It forbids hands to pick or steal, or tongues to bear false witness. It includes the right use of school property, the scholar's clothes, books and playthings; the right place in class; the honest production of work; and it excludes all copying, prevarication, or hybrid

truths. It rejects the *suppressio veri*, the *suggestio falsi*, some forms of diplomacy, much business "cleverness," and any transactions where advantage overrides justice. Its treatment will be similar to that adopted for truthfulness, with the addition that wherever actual theft has occurred, compensation or restoration should be insisted on where possible.

**Tale-telling.**—A clear distinction may be drawn between this and untruthfulness. *The motive is different.* In the one case the motive is bad, in the other it may or may not be good. The tale may be truth—and something more. It is a vice in the clothing of a virtue. There is an appearance of virtue in the apparent desire to check some breach of discipline or morals: but this may be subservient to the desire to inflict pain; to seek revenge; to indulge in spite. Or it may include the element of toadyism; the desire to curry favour. This should be checked, but treated tenderly. So far as it is a desire to please, the motive is good, but weak. Divert it into healthier channels, and try to strengthen it.

## COPYING.

**I. Its Sources.**—Children may copy because they do not know how to do the work set them. This *ignorance* may or may not be the fault of the teacher, but it will be his business to discover and remove it. It may arise from *idleness* or *indifference*, and a reluctance to make the requisite mental effort at the time of the test or other exercise; or there may have been persistent idleness, which may have escaped the notice or may have been beyond the capacity of the teacher to deal with. Where *inattention* is the cause, there is a sense of guilt. The child does not know that which might be reasonably expected of him, fears the consequence of his offence, and so falls a victim to this form of dishonesty. Nervousness, or shyness, or *physical weakness*, may handicap a boy when the explanation is being made to the class, or the information given. The power of *concentration* may be too weak to meet the demand involved by some lessons. Worse than all is the case in which the *moral tone* is bad, and of which copying is merely one evidence.

**II. Its Treatment.**—The following are some of the *means* at the teacher's disposal for the prevention of copying:—

**1. Mechanical Means.**—Copying should be made practically impossible by the arrangement of the classes and pupils. Where possible they should be widely spaced, and sharp supervision should be maintained, and different examples should be given to different pupils. Any facility for copying left

within the reach of a pupil, and especially a young pupil, is a piece of cruel injustice. The moral sense of many children is not highly developed, and it should be the teacher's function to see that no undue strain should be placed upon it at this stage of its growth.

**2. The Teacher.**—The teacher himself may be a cause of copying. If the child copies from *ignorance*, the cause may be insufficient help from the teacher; if from *idleness*, the teacher may be somewhat to blame for the growth and strengthening of the habit; if from *inattention*, the teacher may again be to blame, for either his supervision is weak, or his methods of teaching may be bad, or both causes may operate. Where *nervousness* or *shyness* are the agents, no efforts may have been made to reduce or remove these inflictions. Where the *moral sense* is weak, the teacher must see that there is nothing in his observed life which may offer the least encouragement to deceit. The teacher who cannot be uniformly trusted in the absence of his superior is soon measured and estimated at his proper worth by the class; and he must not be surprised if some weak or vicious member of the class should copy him as well as his neighbour's lessons.

**3. Moral Means.**—A sound moral tone is the best antidote to copying. Cultivate this; live up to it; place the honour of the class in the hands of the pupils themselves; foster a pride in maintaining it; give proper assistance in every case; make the most suitable arrangements to reduce the temptation; and then there will be but little fear of copying.

## UNPUNCTUALITY.

**I. Its Causes.**—These must be carefully ascertained, and dealt with separately. The causes may be various, requiring different treatment; but the majority of cases will be traced to accident, habit, indifference, or some form of temptation.

**1. Accident.**—Here it should be overlooked. If the accidents become too numerous, it then, passes into carelessness, and verges upon the second cause—habit.

**2. Habit.**—This may arise from laziness, or dilatoriness, and in such cases play should be stopped, and some task set whilst the others are at play. If the habit persists, shame might be used; and, as a last resource, corporal punishment or expulsion should be tried, for then it has become sheer obstinacy, or chronic disobedience.

**3. Indifference.**—Some children do not care whether they are punctual or not, and in such cases the moral sense is generally weak. The evil effects of this habit upon the child's future prospects might be pointed out. No one will continue to employ an unpunctual person. If the indifference passes into habit, in so far as it produces the same results it should be treated in the same way.

**4. Temptation.**—The appearance of some local show, regatta, race, circus, etc., or the influence of some evil companion, may cause occasional backslidings. Do not punish such cases, but appeal to the boy's better nature. Urge him to cultivate good habits and a stronger sense of duty. Show him that to withstand such occasional temptations he will require some moral courage, and urge him to show his better nature by making the effort.

**II. To Ensure Punctuality.**—The general means usually adopted to ensure punctuality are as follows:—

**1. Registration.**—Give each child a red mark who is punctual, and each late child a black mark. Apart from other considerations, a pride in scoring the creditable red marks is sufficient stimulus for many. At the end of the quarter a summary of attendances, punctual and unpunctual, should be sent to the parents, and an appeal made for their co-operation.

**2. Prizes, Rewards.**—All the various forms of rewards may be brought into use. A system of tangible rewards should be adopted. 95 per cent. of regular and punctual attendances might entitle to a quarterly card. Two quarterly cards might be exchanged for a prize (a book); whilst 100 per cent. of regular and punctual attendances might entitle to a bronze medal. A continuation of such excellent attendance and punctuality might entitle to a silver medal. This is practically the system adopted by the late London Board. The practice of awarding a card weekly for 10 punctual attendances may or may not be adopted. Much can be said both for and against it.

**3. Moral Means.**— } Both of these have been dealt with above under the  
**4. Punitive Means.**— } head of "Causes".

## TRUANCY.

### I. Its Causes.

**1. Restraint.**—School life is a great restraint to some children. They naturally love their freedom, and view the school as an infringement of their liberty. Freedom is a pleasurable release from restraint, and the pursuit of pleasure is one of the strongest motives in humanity. Such children are acutely sensible to the coercion of the school, especially when they are children of great natural energy. The restraints of school discipline are prohibitions of pleasure.

**2. Parents.**—An ill-regulated, ill-disciplined, or immoral home will often produce truants. Self-indulgent parents, with a weak sense of duty, and over-indulgent parents, can hardly expect a sense of duty to be developed in their children. The training of the will is neglected or misdirected. The result is a tendency in their children to seek their own pleasures in their own way and at their own time. Unrestrained at home, they will not willingly face the restraint of a school. Nor is this the whole of the parental influence. Heredity may be a factor in truancy. The love of roving, the hatred of discipline, may be born in the child, and local circumstances may be unfortunate enough to develop them.

**3. Children.**—The influence of child on child, the sharp over the dull, the strong over the weak, the great over the small, may show itself in truancy. The strong and domineering boy, prone to truancy, is sure to be a centre of truancy. The passionate boy, with strong appetites, the weak, the easy going, the restless, the fickle, the lazy, the school haters, the rovers, the impulsive, the self-pleasing, all may be led away by mutual influence, by a fine day, a local show, or a local race.

**4. Teacher.**—An objectionable teacher produces truancy. Harshness, cruelty, irritability, injustice, carelessness, or incompetency may produce it. Perhaps cruelty is as productive of truancy as any cause. A lack of sympathy on the part of the teacher, the feeling that the boy's position in the class is a degrading one, or one to be derided, the constant wounding of the child's self-love and self-esteem are all possible causes.

**5. Buildings.**—The increasing demands of the Board of Education are making truancy from this source more and more impossible. Schools now are better built, better staffed, better equipped, better furnished, cleaner, brighter and healthier places than formerly. There is no doubt that the dismal buildings of the past with their equally dismal associations were responsible for some of the truancy that was ever recurring. Probably there will always be some truancy, but buildings should be responsible for none of it.

**II. Its Treatment.**—The treatment of truants is especially difficult, but it is not a case for corporal punishment.

**1. Pleasure.**—The class of children who play truant from the feeling of restraint associated with school must be *attracted* into the place. The building should be bright, roomy, airy, and well furnished. It should always be comfortable and healthy whatever the weather. The time table should be based on scientific principles; there should be periods of play each session. The

teaching should be made as attractive as possible; and the recreative side of the school work should be developed. The children will thus gradually see that school is a happy place despite its restraints, and that to go to school is not an infliction, but an advantage.

**2. Impositions.**—In other cases than the last, treat with increasing severity. If the co-operation of the parent is obtained, and the parental influence is sufficient, impositions can be given to be done at home. But this is rarely the case, hence they must be done at school if they cannot be done at home. The staff would have to stay behind in turns for this purpose.

#### **Objections to this Method.**

- (1) Parents often want their children; are often unsympathetic; and sometimes even hostile.
- (2) It throws extra work upon the teachers.
- (3) In large schools it interferes with the work of the school keepers very often.
- (4) It breeds a hatred for school work.

**3. Detention.**—Simple detention with no imposition is preferable to impositions; but it is open to the same objections principally.

**4. Fines.**—Stop the play, and deprive of any other privileges prized by the children of the school. This is only available for beginners.

**5. Home Treatment.**—It is best to write or visit, or invite a visit from the parent, and to place the whole matter in their hands. Show that truancy is an offence as much against home authority as school authority—some think more so. Have nothing to do with the punishment yourself, if you can help it. The teacher's work will be to win the boy into the school, not to thrash him in; and at the same time to try and cultivate his moral sense.

**6. Expulsion.**—As a last resource this may be desirable and efficacious where it can be done. It helps to awaken hostile and indifferent parents to a proper sense of their duty.

**7. Truant Schools.**—These are only used for incorrigibles, and where they are available expulsion becomes unnecessary. The disciplinary life of a truant school for a period has been found the best treatment for bad cases yet devised.

**HABIT.**—The best way to discipline children is to help them in the formation of good habits, for then the discipline will be a lasting influence. For this purpose both the nature and training of habit should be known.

**I. Nature of Habit.**—After a thing has been done a certain number of times, there is a tendency to perform the action again on the slightest stimulus. After many repetitions, the action becomes very mechanical, and almost automatic. In this respect it resembles instinctive or reflex action. As a rule, to perform an act requires a stimulus, and there is desire or compulsion prompting to the action. As habit grows, desire or compulsion becomes weaker, and a fixed disposition to act in the way specified is formed. This shows two facts as essential.

**1. The Psychological Fact.**—By this is meant there is a fixed disposition to perform the action, and that, too, without the promptings of desire.

**2. The Physiological Fact.**—This means that there is a modification of the nerve structures involved, and this depends largely upon nutrition. A well-nourished child is a favourable subject to work upon.

The habit may be mental as well as physical. We are said to have a habit of thought when we are subject to recurring modes

of mental operation. Association is another element. Some stimulus gives rise to some movement, and by association there is a tendency for the one to recall the other.

**II. The Training of Habit.**—Its importance is obvious, for habit is called second nature. We are creatures of habit, but we ought not to be its slaves. The teacher's function is to form good habits. To do this he must induce his scholars to make an effort, which must be sufficient to act as a *motive force*. Then there must be plenty of *repetition*, that the habit may grow and become independent of the will. Child life is the best period for this training. *Example* is necessary, as this brings into play the faculty for imitation, and lends consistency to the growth. Then the response to the stimulus must be *prompt*, for uncertainty and delay in response show imperfect habit. This course of training must be pursued until the child finds it produces discomfort to deny the habit, or difficulty to alter or regulate it.

**CHARACTER.**—The cultivation of good habits is a great aid to the formation of a good character, and this should be looked upon as the ultimate goal of all discipline. The term has a wide range of meaning, but in education it is generally used to denote in a special way a good or virtuous disposition of the feelings and of the will.

"A perfect moral character includes the familiar habits involved in a wide pursuit of individual good, such as industry, orderliness, temperance, the habitual control of the feelings, or moderation, and the firm control of the thoughts involved in reasonableness. It includes further the habits implied in a perfect fulfilment of human duty, as obedience, courtesy, veracity, justice, and beneficence." *The essential ingredient is fixity of disposition in right directions.*

But a perfect character also shows itself in a habitual and half mechanical pursuit of a number of detached ends or forms of good; it includes a disposition to reflect and deliberate when occasion requires.

**Its Cultivation.**—A mere glance at the circumstances of early life tells us that the actions of a child are determined and regulated to a considerable extent by the wishes and commands of others, *i.e.*, the first stage is to teach the child *obedience*. Sometimes it will be necessary to restrain or command, sometimes to persuade, advise, or enlighten; hence a study of character in each child is absolutely necessary.



The most powerful stimulus to goodness in others is *goodness in oneself*. Any one who can resist the influence of this mutual goodness, showing itself in actions good to giver and receiver, is a fit subject for the government of fear, and nothing else. But the good and kind teacher will require to study character so as to be able successfully to discriminate between the two classes. "Do unto others as they do unto you," is as much as can be expected of children in this direction; and the teacher who does not study character will probably ask too much or too little, to the injury of all concerned.

There must be an appeal to the *feelings*, for it is wrong to work by fear or pain alone. No good character could be formed in that way. The maxims of punishment must be grasped and applied upon an individual study of character. In this way the dispositions that lead to disorder and offence can be checked in the bud; and, indeed, until there has been time for such training to operate, the mind should not be exposed to temptation. For this purpose the *social affections* should be cultivated.

*Activity* should be recognised and utilised—not repressed. A child of an active temperament should be kept busy; whilst less demands should be made upon the weak and languid. Hence the work, to be profitable, needs differentiation. So far as the large classes of modern schools will permit, this principle of child life should never be neglected. Character will only be good and strong so long as it is built on the regulated forces of nature.

The *temperament* must be recognised and allowed for. The sanguine, the boastful, the self-assured may need checking; whilst the nervous, the timid, and the shy will need encouragement. The worse faults of child nature must be treated with care, kindness, and patience. The best results of the teacher's efforts will often be slow to show themselves, for character is the growth of years.

*Variety* is the spice of life, and this is remarkably true of child life. Monotony must not be allowed to deaden the budding gems of nobler thoughts and nobler aspirations which may be struggling to show themselves. Sustained effort is difficult to children, and it must ever be remembered that the moral side of child life often demands mightier efforts than anything submitted in the school curriculum.

## EXAMINATION QUESTIONS.

- 1.—Why should young teachers be restricted from the use of corporal punishment, (a) for the sake of their scholars? (b) for their own sake?
- 2.—Point out some of the ways in which school discipline may be useful in producing habits of ready obedience, and name some characteristic features of good discipline.
- 3.—Show that rewards may be usefully employed in stimulating children to work. Name some rewards that may be connected with the daily work of the school.
- 4.—Show that clear distinction may be drawn between truthfulness and "telling tales". How can older boys be employed in assisting to maintain the discipline of a school?
- 5.—Show that inattention in a class may proceed from the faults of a teacher, or from causes other than faults in the children themselves.
- 6.—Show that harshness and untruthfulness in a teacher influence the character and behaviour of children out of school.
- 7.—Show that copying, especially in arithmetic, may be the result of bad teaching or of bad discipline. What precautions would you take to prevent the growth of such a habit?
- 8.—Is it a sufficient definition of good discipline to say that "it is the power exercised by the teacher over the children"? Give some distinguishing marks of good discipline.
- 9.—Show that what is called stupidity in children may arise from faults on the part of the teacher. Name some of the faults.
- 10.—Name some of the chief causes of truancy arising from faults in the teachers, or parents, or children. What steps were taken in your school to acquaint parents with irregularity of attendance? How were truants punished?
- 11.—What is truthfulness? Name some ways in which a child may be untruthful in act without saying a word.
- 12.—Were any special means used to secure the co-operation of the parents of the children who attended your class; and, if so, what was the result?
- 13.—By what special means would you try to promote truthfulness and punctuality among your scholars? State the motives which you would lay before your scholars as incentives to the constant observance of truth and punctuality.
- 14.—Give your opinion as to the value of rewards and punishments; and state the principle on which you think they ought to be administered.
- 15.—Mention any difficulties you may have met with in the effort to control the children you had to teach, and state how those difficulties were overcome.
- 16.—Illustrate from your practical experience, in a day school or elsewhere, the vital importance of securing good order in a school.
- 17.—How were you accustomed to deal with dull, lazy, or obstinate children, and what special means did you adopt for securing the attention of the children in your division?
- 18.—What methods have been adopted within your knowledge for correcting these faults in children: inattention, untruthfulness, laziness, impertinence, sullenness, and with what effect?
- 19.—It is said in the "Instructions to Inspectors" that, besides the usual course of instruction, an excellent school "seeks by other means to be of service to the children who attend it". Can you name any such means, and say which of them are likely to be most effective?
- 20.—How far is it in the power of a teacher, by other means than school lessons, to improve the habits, manners, and character of the children of a school? Mention any ways you know by which a teacher may exert useful influence in these respects.
- 21.—What is meant by good discipline? What are the means and ways of improving discipline?
- 22.—What are the best expedients you know for quickening and securing the attention of a languid or disorderly class?
- 23.—In some countries the teachers are absolutely forbidden to make use of corporal punishment in any form. Say by what other means it is possible to maintain discipline under such conditions.
- 24.—What is a criticism lesson? Under the head of "discipline," what points would you attend to in such a lesson?
- 25.—In what ways may success in class teaching be promoted by studying the characters of children?

*This Chapter is continued in the Appendix.*

## CHAPTER III.

## CLASSIFICATION.

**I. Its Basis.**—A school may be classified on a *single* or on a *plural basis*. On a plural basis classification is a simple matter, but on a single basis there is more difficulty. In the former case a pupil simply goes to the class in each subject for which he is most suited, but in the latter case the following facts must be borne in mind:—

1. Attainments differ.
2. Ability differs.
3. Age may, in special cases, have to be considered.
4. Special aptitudes and different rates of development in different children have to be allowed for.

Generally age and length of time in school will count for little or nothing. **Equal attainments are the only real basis on which to proceed.**—Most schools adopt the single basis, but perhaps it is best to have a *dual classification* based on Reading and Arithmetic. Progress in these subjects is often very unequal, and so it would generally be more profitable to teacher and scholar to adopt the double basis. Where the single basis is adhered to, Arithmetic should be the deciding test. Inequalities in other subjects lend themselves more readily to class teaching than in Arithmetic, because greater mental demands are made by it. The industrious but dull pupil always labours with it; the careless one is always in trouble with it; whilst the inattentive fails at it because it is synthetically progressive.

**II. Bad Classification.**—There are certain evils associated with bad classification, so called; but the term is almost a contradiction, for classification is grouping according to real resemblances, and the real ones in school are ability and attainments. Some of the most obvious evils are as follow:—

1. There is a *waste of time*, for the pupils are not placed where they will obtain the greatest profit.
2. The *sympathy and respect of the class are lessened*, hence the teacher is robbed of his legitimate means of evoking the intelligence and activity of his pupils.

3. It prevents the children having constant and suitable employment.
4. *It injures discipline* for the reasons already given.
5. It produces *dissatisfaction* among the parents, and injures the reputation of the school.
6. It may cause *pecuniary loss* to the school, both directly and indirectly.
7. It advertises the *incapacity* of the teacher.

**III. Infant Schools and Classification.**—The Infant School contemplates in the *length, variety, and character* of its lessons the training of scholars whose delicate frames require very careful treatment. It is essential, then, that the *length* of the lesson should not in any case exceed thirty minutes, and should be confined in most cases to twenty minutes; and that the lessons should be varied in length according to the section of the school, so that in the babies' room the actual work of the lesson should not be more than a quarter of an hour.

Each lesson should also be followed by *intervals of rest and song*; the *subjects* of the lessons should be varied, beginning in the lowest section with familiar objects and animals, and interspersed with songs and stories appropriate to the lesson; the spontaneous and co-operative activity of the scholars should form the object and animate the spirit of each lesson.

*Children will be classified according to ability*, and not rigidly according to age. As a rule, the right classification of the children in an infant school will be found to correspond nearly with their ages. The best basis is Reading, because, as a rule, this will be found to agree broadly with age classification.

*Age classification is unnatural*, and should only be followed so far as equal attainments are coincident with the average equal age. Backward children admitted during the year, however, should not be allowed to drift into the baby class. The discipline, association, and instruction of this class would be most unsuitable for elder children. They should form a special class, or otherwise receive special treatment until they are fit to be drafted into one or other of the existing classes.

It will now be observed by the student that the single basis of classification in an upper department should be Arithmetic, and in an infant school Reading.

**IV. Sub-division of Classes in Infant Schools.**—Where possible, sub-division should be followed in the following lessons:—

1. **Needlework.**—Little fingers are not likely to thread and use a needle properly, or with profit, without much supervision and showing. Individual assistance will be largely required, and this will be impossible in large classes.
2. **Writing.**—In the early lessons, it is very important that the position of

the child and the manner of holding the pen or pencil should be well watched. Habits are being formed which will be physical evils if not closely watched and corrected. A smaller class is absolutely essential for this.

**3. Reading.**—The best practice in reading is individual practice. This is impossible in a large class. For the formation of a good enunciation, a distinct and clear articulation, the teacher must give the child much individual attention.

**4. Drawing** requires much assistance, and consequently a small class is essential. If the proper and necessary assistance is not forthcoming in such subjects, the child may form a dislike for it—a very undesirable result.

**V. Shapes of Classes.**—The shapes of the various classes depend on:—

1. The number of children in the class.
2. The amount of space available.
3. The furniture and its arrangements.
4. The amount and nature of the staff.

#### A. Reading.

1. *In Desks.* Children can sit or stand in their desks. This is not a good arrangement, even if the floor be stepped; for, if sitting, the pupils lose the chance of a necessary change of position, and they are apt to become indolent and inattentive. If standing, there is the tendency to lounge against the desks, and to produce a slovenly and disorderly appearance in the class.
2. *Drafts.* These should be formed out of the desks.
  - (a) *Semicircular Drafts.* This method is preferable to the desk method, as it secures the desired change of position, brings the pupils more directly under the observation and control of the teacher, and offers less opportunity for the formation of bad habits.
  - (b) *Parallel Drafts.* The smaller children should be in the front row and the taller boys behind. The teacher will then be able to stand in front of the class, and have it completely within the range of his eye.

#### B. Arithmetic.

The children can be arranged as in reading, but only in drafts when working on the slate, on the B.B., or from dictation. Usually this lesson will be given in the desks. If space permits the wide placing of the pupils, this arrangement is very satisfactory. But space rarely does permit. The class can then be *examined* or *worked* in two sections. It can be *taught* in one. The system of alternate boys working different examples tends to check copying, and to promote honesty, power, and independence. These advantages perhaps more than counterbalance the extra expenditure of time involved.

#### C. Geography.

Here the children can either be arranged in *desks* or on a *gallery*, if the school possesses one. The latter is the better arrangement, if the class be a junior one, and is working from the map. If an upper class and atlases are being used, the desks are the better.

The *position of the teacher* is important.

**Reading.** He should be in front of the class and to the centre. He should stand back sufficiently to bring the front rows under his observation.

**Geography.** If pointing to the map, he should be to the right, where his map should be placed. If the map be placed in front, he must either point inaccurately, or leave his class without supervision for short periods; which, however, often prove long enough to encourage inattention and disorder. If atlases are being used, he should be in front.

**Arithmetic.** Same position as for geography. The B.B. should be to the right, so that the teacher can work and still keep the class somewhat under supervision. When the B.B. is in front, he quite turns his back upon the class, and the class often shows that it is aware of the fact. If the boys are working examples, he should stand in front and carefully watch to check any idleness or copying.

**VI. Collective Lessons.**—It is often desirable and convenient to group classes for some lessons, as it tends to economy in teaching power, and sets free one or more teachers for correction, preparation, or clerical work. In an infant school this grouping can be well done on a gallery. In an upper department, it might be done in the central hall, or in one of the larger rooms. There are certain subjects which lend themselves easily to the collective arrangement.

**1. Singing.**—Here sympathy of numbers will aid the physical and artistic training given by the teaching of this subject. Melodies and simple part songs, rounds and elementary sol-fa lessons can be better taught to a division than to a class, for such grouping gives confidence to the timid and shy.

**2. Recitation.**—Repetition and explanation, with some pattern work, is the programme here, and such instruction can be given to two classes as well as to one.

**3. Scripture Lessons.**—The moral truths of Scripture are generally presented in some biblical story, which can be given in a manner quite within the grasp of several classes, without forfeiting the natural attractions of a story to children.

**4. Information Lessons.**—Common information lessons can be given to many pupils at the same time, especially if the lesson is enlivened by a few sketches, diagrams, pictures, or experiments.

**5. Musical Drill.**—The size of the division will be limited by space sometimes, but a certain amount of grouping for small schools is possible.

**6. Ordinary Drill.**—After some preliminary lessons have been given, children may be grouped for military or Swedish drill. The added numbers generally bring added interest and added pleasure. This will apply only to small classes.

**7. Kindergarten.**—Some of the lessons admit of grouping (see chapter on "Kindergarten").

**8. Class Subjects.**—Their very name implies the possibility of grouping. Grammar, geography, history, elementary science, domestic economy, may all be grouped for instruction.

**9. Elementary Subjects.**—Mental arithmetic, and, in some cases, writing, also lend themselves to this arrangement.

A change of place and attitude is an absolute physical necessity. It affords a welcome relief to the sitting in desks, releasing one set of muscles, and bringing into play another set. It is a check to twisted shoulders, curvature of the spine, and injury to the eyesight, all of which may be induced by careless and continuous service in the desks. For Singing it offers special physical advantages, a standing position giving better play to the lungs.

**VII. Promotion.**—Promotion should be systematic and regular. Quarterly or half-yearly examinations should be held, and

the sharpest or best prepared drafted into higher classes. Otherwise, bad effects are produced on the scholars.

1. They find time for *mischiefs*, for necessarily they must be *idle* part of their time, or working fruitlessly.
2. They *wear* of their work, which becomes a sort of mental treadmill—ever moving, never advancing.
3. They frequently form a *dislike for school* altogether, and become more or less *irregular*.
4. They *interfere* with their slower comrades.
5. They often *retrograde* themselves, for monotony stunts.
6. Their non-promotion is *an injustice* to all concerned; to the child, who has a right to as much, and to the best, instruction the school can give: to the parents, and to the country, who share that right.
7. School life is short, therefore *progress should be as fast as Nature will permit*.

### HOME LESSONS.

**I. Subjects for Home Lessons.**—The most appropriate subjects are those which involve either:—

1. **Reproduction** of some portion of the day's work, as in geography, arithmetic, grammar, or composition; or

2. **Preparation** for the next day's work, like spelling, map drawing, memory work (recitation, geographical facts, chronology in history, rules, tables, exceptions in grammar, etc.).

**II. Revision of Home Lessons.**—The time and methods of revision will depend on the methods of instruction and the subjects taught; and, probably, in some schools, upon the staff also, but it is assumed that all schools are staffed properly in these suggestions.

**Spelling** would be part of the dictation lesson.

**Arithmetic** can be marked by monitors or young teachers during some collective lesson. The chief errors can then be explained and corrected on the B.B.

**Grammar.** Parsing and analysis can be corrected as in arithmetic, or, with a good teacher, in the grammar lesson itself. Let boys change books, the method or order of change being varied from time to time. The teacher will parse and analyse the piece, the boys writing in the corrections in black lead, coloured ink, or pencil. The number of errors should then be neatly placed at the bottom of the exercise, and the exercise should then be initiated by the boy who corrects it. This checks all spite, carelessness, or collusion between boys; for the inaccurately or dishonestly corrected exercise can always be traced. This method also acts as a good disciplinary training to the boys, and helps to fix their work. It ensures a maximum of attention, but it should only be used with the elder scholars. Memory work can be tested in the grammar lesson itself.

**Geography** can be tested during the geography lesson; maps by monitors or pupil teachers during the collective lessons. The prevailing errors should then be dealt with on the B.B. If the geography is an abstract, it must be corrected out of school hours, or as in grammar.

**Composition** must be marked out of school hours, or by young teachers during collective lessons. Correct the chief errors on the B.B., or, if composition lessons figure on the time table, the home lessons could be marked while the class is at composition.

**Scripture** should be tested in the Scripture lesson, or marked out of school hours.

**Arguments for and against Home Lessons.****For.**

1. They cultivate *self-reliance and industry*.
2. If honestly done they are a *true index of the child's own powers*.
3. They make a *favourable impression* on some parents.
4. They *supplement and fix the learning* of the child.
5. They *set the master at liberty* for higher work.
6. To a certain extent they keep children from the bad influences of the *street*.
7. Under certain conditions the Board of Education recommends them. Their use should be "to illustrate and to fix in the memory lessons which have already been explained in school, rather than to break new ground or to call for a new mental effort. This purpose is served by lessons of a simple and definite character—a sum, a short poetical extract, a list of names or dates, a letter, an outline map, a parsing exercise, such as may be readily prepared in half an hour, and may admit of very easy testing and correction on the following day. When these conditions are fulfilled, the home task is found to have a very valuable effect, not only in helping the progress of the scholar and in encouraging the habit of application, but also awakening on the part of the parents an interest in the school work." (Revised instructions to H.M. Inspectors).

**Against.**

1. *The school day is already too long* for young children, some of our best authorities say.
2. They conduce to *over-pressure*, and may be physically injurious.
3. They frequently cause *friction* between parent and children and teacher.
4. *Public opinion* is in part opposed to them.
5. They may become *injurious both mentally and morally* by the formation of bad habits through want of proper supervision.
6. There is *little or no accommodation* in many of the homes for the doing of them.
7. *Change of thought is necessary* for the healthy development of brain power. A child should not take the school home with him.

**HINDRANCES TO PROGRESS.**—These may have a twofold

origin :—

1. **From the Children.**—Here again the causes may be various.

(a) *Stupidity.* See notes on stupidity.

(b) *Poor Living.* This may be partial only, local, or intermittent. But it is a serious hindrance. The difficulty is now grappled with by the institution of large agencies for cheap and free dinners. Thousands of children are now fed at times in this way. This treatment has proved its own value both physically, morally, and mentally.

(c) *Clothing.* Children are insufficiently clad, and consequently physically uncomfortable, perhaps suffering. Appeal for old clothes in the local press or in any direction where your appeal may be successful.

(d) *Irregularity.* This is the greatest hindrance to progress that teachers have to grapple with. It arises from such a multiplicity of causes that to attempt a detailed account of its treatment is impossible here. The teacher's chief function in this matter is to make his school as attractive as possible, to show a practical interest in his pupils by the formation of and participation in cricket, swimming, and football clubs; to report on all absences promptly; to develop the sense of duty in his pupils as far as he is able; and then to leave the rest to the parents and the visitors.



**2. Teacher.**

- (a) *Bad Classification.* This is a fault of the teacher's. It can only be removed by thought and the study of good models.
- (b) *Bad Methods of Teaching.* Teacher must read and study, and then practise better methods of instruction.
- (c) *Harsh Discipline.* Harshness defeats its own ends. It may produce quietness, but this deceives no expert. The vitality of the children is lowered, and therefore the capacity for work is diminished. Besides, there are strong emotional disturbances set up which are very hostile. See under the head of "Harshness" in the chapter on "Discipline".

**TIME TABLES.**

**I. Revised Instructions and Time Tables.**—Every time table has to be approved on behalf of the Board of Education by H.M.I., who thereby certifies that it fulfils the requirements of Section 7 of the Elementary Education Act of 1870. He will expect the time table to show that a due proportion of time is assigned in Infant Schools to manual exercises and recreative employments, and in other schools to each of the subjects of instruction, including any specific subject which the school professes to teach. *Nothing should be attempted which, having regard to the proper classification of the scholars, and to the number and qualifications of the teachers, cannot be efficiently taught in the ordinary school hours.* Scholars are not to be improperly detained beyond the prescribed time. The time table is also to be placed in a conspicuous position in the schoolroom, and it must be followed throughout the school year.

**II. General Directions.** The writing of a time table is very difficult, because of the number of considerations to be studied. No set or stereotyped time table is possible, because of the varying conditions of the different schools. All that can advisably be attempted is the laying down of the chief principles and rules to be observed in their formation.

**1. Building.**—Consider the number and size of the rooms in your department, and the quantity and kind of furniture. A time table can be more easily made for a school containing several class rooms than for one without them. The supply of desks, galleries, etc., will determine the nature and order of the lessons.

**2. Staff.**—The best disposal of a staff is important. Each teacher must be placed where he can teach to the greatest profit. Manifestly a time table for a school with assistant teachers will be different to one with pupil teachers or monitors.

**3. Class of School.**—Whether boys', girls', infants', or mixed; whether full time or half time; whether a poor class school or one placed in a good neighbourhood; whether small or large; whether backward or well taught.

**4. Locality.**—A town school will require a different time table to a country school; a school in a manufacturing district, to one in a rural, marine, or mining district.

**5. Time.**—The number of hours in the school week; the length of school life; the amount of time to be given to each subject; the length of each lesson—all these have to be considered and regulated. No lesson should be more than three-quarters of an hour, and the length of lesson should be graded to suit the age and capacity of the children. More time will be required for the *Elementary Subjects* than for the *Class*, and more for the *Class* than for the *Specific Subjects*.

**6. Laws of the Mind.**—The lessons must be so arranged as to afford the necessary mental rests. The lesson of much mental effort must be followed by a mechanical lesson; e.g., writing might follow grammar, or *vice versa*. Then the most exhausting subjects should come in the morning, and they should be the first lessons.

**7. Classification.**—The basis of classification adopted in the school must be considered. Most primary schools are classified by the standards; but where this is not done, the school should be classed on a basis of arithmetic or reading. The number of classes must fall within the limits of the staff, and the accommodation of the rooms.

**8. Official Rules.**—The Government lays down certain rules and limitations with respect to time tables, and these must be considered. Councils, etc., sometimes order that so much time per week shall be given to certain subjects (e.g., religious knowledge, singing, drawing, manual instruction, etc.). Under some Authorities the nature of the time table is much influenced in this way.

**9. Recreation.**—The time table should show about ten minutes each attendance for play. In the upper department, military, musical, or Swedish drill will be taken, and this must appear in the time table.

**10. Registration, etc.**—The time devoted to this should always be shown. If the registers are marked twice each attendance, once for the early and once for the late pupils, both should appear on the time table. Assembly, religious observances, and dismissal should also be shown.

**11. Locomotion.**—Physical relief must be arranged for. The classes will require to remove from the desks to the drafts, or to the gallery or class room. This must be so arranged as to cause a minimum amount of noise and disturbance.

**12. Summaries.**—Three tables or summaries should appear on each time table:—

- (a) A list of the subjects taught, and the total number of hours given to each per week.
- (b) The number and quality of the staff, i.e., head teacher, assistants, and pupil teachers.
- (c) A small table showing when the model and criticism lessons are given.

### III. Advantages of Time Tables.

**1. To the Children.**—They discipline work and teach the value of method and punctuality. The children become habituated to obedience to rules laid down by others, and this is a gain for the State. The steady and regular habit of work enforced by the time table is forming habits which will beneficially influence their adult life.

**2. To the Teacher.**—His time is spent to the best advantage under its guidance. The mental wear and tear is considerably less. He knows his work for each hour, and soon falls into a well-arranged and busy routine, which is a means to his happiness. The children have their faculties worked to their best advantage, and this is more productive both to teacher and those taught.

#### IV. Distribution of Time.

**1. In Infant Department.**—Infants have to be taught suitably to their age, and suitable instruction involves a suitable distribution of time. The young teacher is therefore advised to make a copy of the time table in the Infant Department, and also to obtain copies of the time tables of several other Infant Schools. These time tables will show instructive differences, which should be studied.

Registration, Religious Observances and Scripture will occupy over four hours per week; Nature Study, five lessons of fifteen or twenty minutes; Arithmetic, five lessons of twenty minutes; Writing, five or half an hour; and play, ten intervals of fifteen minutes each. The babies would play at a different time, have more play (say two periods each of fifteen minutes in the mornings and one of the same length each afternoon) and would probably be engaged looking at pictures when the other children were at play. Five lessons per week, each of twenty minutes, also might be spent at Reading. The babies, however, would have no Reading, and the class above the babies would confine its Reading exercises to Letter Games. Drawing, Free Arm in the upper classes, Mass Drawing in the lower and Drawing in sand for the babies might be allotted one and a half hours per week; while five Object Lessons, each of twenty minutes, should be included. There would be no Needlework except in the top, or two top classes, and two periods of forty minutes each week could be devoted to this Manual Exercise. Whilst the upper class was Sewing the lower classes could enjoy Story Telling, or be engaged in some of the many Kindergarten occupations or games. Drill and Recitation might be completed, and half an hour spent at them each afternoon. Kindergarten would require about six lessons (each of twenty minutes) per week, and probably an extra lesson or two for the babies. Singing should be given four lessons of twenty minutes each, and two or three Conversational Lessons might also figure on the time table. The intervals between the lessons should be brightened by a few minutes of song, play or drill.

The order of the lessons is also important. The Nature Lesson could be taken directly after Scripture, and Arithmetic should follow, as the children are then most capable of mental effort. For the same reason the Object Lesson should also be a morning study. Singing, Needlework, Recitation and Kindergarten will be found the most suitable subjects for the afternoon session.

**2. In Upper Department.**—Here the distribution of time will vary so often that it is almost useless to suggest any scheme for imitation. The district of the school, the quality of the children, the teaching staff, the building, the apparatus, etc., are all varying factors, giving varying products. The young teacher is advised to make a copy of the distribution of the time as shown on the school time table, and to insert it for reference and illustration in his note book or method book.

#### EXAMINATION QUESTIONS.

- 1.—Notes of lesson on *Home Lessons*.
- 2.—Give some of the subjects appropriate for home lessons, and give a sketch of a week's home lessons for scholars in the Fourth Standard.
- 3.—Show that for some lessons infant classes should be smaller in number than classes composed of older children, and that for other lessons one or more classes may be grouped.
- 4.—What bad habits are produced by careless correction of exercises and by want of attention to home lessons?

5.--Name some suitable subjects for home lessons, and state the most suitable times and methods for their revision. What objections are sometimes raised to home lessons?

6.--State fully the bad effects that are produced by retaining a clever child in one class for a year without due promotion. How often should promotion be made?

7.--In what different shapes may classes be arranged for Reading, Arithmetic, and Geography lessons? State which shape you consider best for each purpose, and why you would employ that arrangement. What should be the position of the teacher in regard to his class?

8.--What bad effects are produced by imperfect classification, both upon the more and less advanced members of a class?

9.--What were the chief hindrances in the way of the progress of the children you used to teach, and how did you attempt to remove them?

10.--Out of twenty-five hours a week in an infant school, or out of thirty hours in a school of older children, what time should be devoted to each employment or subject of instruction? Give your reasons.

11.--What is the best classification of an infant school? What exercises in number would be suitable to each class?

12.--On receiving new scholars in the school, what is the best way of deciding in which class to place them? Give reasons for your answer.

## CHAPTER IV.

### METHOD. MAXIMS OF TEACHING.

**DISCIPLINE** is the first essential for class teaching; the power to teach is the next. The power to teach implies adequate knowledge on the part of the teacher, a sympathetic nature and good methods of teaching. Good method embraces the *what* and the *how* of teaching; that is, the teacher has to decide not only the kind, quantity and quality of his subject-matter, but also the way in which that matter shall be presented to his class. To do this successfully it will be necessary to recognise the double aspect of Education and to clearly distinguish between the processes of Instruction and Education.

Education is both an Art and a Science. An Art teaches to do and prescribes rules and methods for the processes involved. Education is an Art because it applies rules and principles for the acquisition of Knowledge, and affords plenty of exercises for the application of those rules. It views learning as a valuable acquisition for the practical side of life and for this purpose it utilises rules and methods of teaching rather than frames them. It is the medium of the *what* and *how* in teaching.

As a Science it teaches us to know. It unfolds the *why* and *wherefore* of our rules and methods. It examines the laws of the mind and its development, and lays down rules and methods in accordance with those laws. The chief aim of the art is informing and doing; of the science, training and developing. Science is thus the mental legislator; art the mental administrator.

**Instruction and Education.**—Roughly, it may be said, then, that the Art of Education instructs; the Science of Education trains. But each school subject brings both its instructive and its educative side into play. Either the one side or the other may dominate the work of teaching that subject, but both sides should be present. For instance, in the subject of Arithmetic rules are taught as useful information; that is, the rule is explained and

then examples are worked under that rule. That is instruction. But if there is an examination of the processes employed for the discovery of a rule, that is training or education. A case in point would be the reason why  $3\frac{4}{5} = \frac{315}{100}$ . The chief differences may be briefly tabulated thus:—

Instruction.	Education.
<ol style="list-style-type: none"> <li>1. Feeds minds to make them grow; <i>i.e.</i>, it promotes mind growth.</li> <li>2. Is a monologue method of teaching mainly; it is the lecture form of teaching, utilising description and explanation.</li> <li>3. Is the method of proceeding from generals (<i>e.g.</i>, rules of arithmetic) to particulars (<i>e.g.</i>, examples or exercises under those rules).</li> <li>4. Is a method of specialisation; <i>i.e.</i>, it may prepare for special pursuits and callings (<i>e.g.</i>, shorthand and typewriting for the clerk).</li> </ol>	<ol style="list-style-type: none"> <li>1. Exercises minds to make them develop; <i>i.e.</i>, it promotes mind development.</li> <li>2. Is a dialogue method of teaching; <i>i.e.</i>, it is a method of discovery, utilising experiment, observation, questioning and the conversational method.</li> <li>3. Is the method of proceeding from particulars to generals (see p. 49).</li> <li>4. Is a method of generalisation. Its aim is to fit the pupil generally for the battle of life.</li> </ol>

Having mastered these facts the young teacher is now in a position to study some of those cardinal principles or educational maxims which should fashion all good methods of teaching. These principles are really few in number, although, from the use of nearly synonymous forms they may appear to be many. The object of this chapter will be to explain briefly these principles, thus incidentally reducing their number; and to introduce some order into their classification. In pursuit of this aim Methods of Teaching may be considered from three standpoints: (1) the learner, (2) the matter taught, (3) the teacher.

**I. Method as Influenced by the Learner.**—Children learn to think long before they enter a school, and like all sane people, they think in certain well-defined ways; that is, they have certain common forms of thought. We are thus led to the first great principle of teaching, the proceeding from the Particular to the General or from the Individual to the General.

**1. From the Individual to the General.**—The teacher's task is to give the child individual notions and then to aid him to pass from those individual notions to general notions.

All knowledge is obtained from notions, because they form the elements of thought. The *individual notion* is obtained through the senses; *i.e.*, by observation. The child sees, feels, handles,

tastes or smells the object and so gets a stock of ideas about it. This is what is known as the *Objective Method* of teaching. Its most familiar applications are the Object Lesson and the various Kindergarten exercises. But it has a much wider scope, for it should help to fashion the teaching of many other subjects in the school curriculum.

A boy's individual notion of a plum is the sum-total of the sensations which the plum gives him—form, colour, etc. The notion then is complex, for it is built up of many elements. Now all knowledge begins with these complex individual notions and therefore all education should start with them.

The teacher performs an experiment to show that water presses downwards, and the class thus gets the individual notion that water presses downwards; another experiment shows that water presses upwards, and the children gain another individual notion; similarly another experiment gives the individual notion that water presses sideways. The child then easily passes to the *general notion* that water presses in all directions. The general notion thus refers not to individuals but to classes. The notion is fixed by words in the form of a definition; for as soon as the child has formed a class, *i.e.*, as soon as he has passed to a general notion, he has framed a definition of that class; *e.g.*, his definition of a dog would be an enumeration of the common properties of all dogs—four legs, tail, barking, etc. For this reason, this method of acquiring the general notion has been called the *Defining Method*.

**2. From the Concrete to the Abstract.**—This is no new principle. It is merely a re-statement, or a particular aspect of the previous one. An examination of an instance will show this.

2 sticks and 3 sticks together are 5 sticks	} and so on, varying the instances or objects.
2 cubes and 3 cubes together are 5 cubes	
2 marbles and 3 marbles together are 5 marbles	

The child thus learns that 2 of anything and 3 of anything are 5 of anything, and so ultimately that 2 and 3 are 5. He has progressed from the knowledge of individuals (sticks, etc.) to general classes (2 and 3 are 5); from a knowledge of concrete things to that of their abstract qualities; from the individual notions (sticks, etc.) to the general notion or mathematical definition (2 and 3 are 5).

**3. From Examples to Rules and Laws.**—Examples and details must precede rules and formulas, whether in the region of

science or language. 'This is another sound maxim of teaching, but it is not new. Its truth is embodied in the two previous maxims.

The class examines selected sentences (examples); *e.g.*, cats purr; dogs bark; birds fly. By questioning, the *subjects* of speech in each case are elicited—cats, dogs, birds. Further examination discovers that the second word in each sentence expresses an action; *i.e.*, it says, asserts or *predicates* an action of its subject. The class then gives the definition of predicate—provisional in this case. An examination of further sentences (examples) would lead to a final definition.

In each case the teaching proceeded through examples to rule or definition, through an examination of individual cases to general truths or laws.

**4. From the Known to the Unknown.**—A child's knowledge is vague and imperfect, hence the teacher should question to discover the value and extent of what the child "knows" before he begins to work from it as a starting point. His aim should be to start with adequate and accurate knowledge, so that the reasoning involved may be accurate. Reasoning is the faculty of deducing unknown truths from truths already known. If the initial knowledge be faulty the reasoning cannot be satisfactory.

A young seedling is pulled out of the ground. Its root is cleansed and noted to be white. A stick of celery is shown. Some ordinary, freshly-plucked leaves are examined, and in each case the under side is noted to be paler than the upper side. These facts and similar ones are observed and known. It is then inferred that light is necessary for the production of colour in the plant—a fact which was unknown. The teaching thus proceeds from concrete, individual, known examples (the plants) to the general truth concerning light and colour.

**5. From the Simple to the Complex.**—The word "simple" as used in this maxim must be taken relatively. The starting point in any given case (*i.e.*, the simplest idea or ideas for the pupil) will depend upon his mental development, his attainments and the teacher's degree of knowledge of these facts. What may be simple to an older scholar may be more or less complex to a younger pupil.

In a Writing Lesson a child first makes the right line, then the link, the hook, etc., and gradually combines these elements



into letters and words. He thus proceeds from the simple (elements) to the complex (written words).

**6. From the Indefinite to the Definite.**—A child's brain is immature. His ideas are vague and crude. Hence the teacher starts with the crude, vague, indefinite notions of the child, which, with the aid of tuition, experience and observation, gradually become clearer, more precise and more definite.

The child's idea of a cat is probably that of a domestic pet. His knowledge of the cat will embrace some details of structure and habit but that knowledge will be both vague and incomplete. After a good Object Lesson on the cat he not only learns more detail of its habits and structure, but he learns something of the adaptability of structure to habit. His knowledge is progressing and becoming more definite.

**7. From the Empirical to the Rational.**—By empirical knowledge is meant that which is the result of experience. Rational knowledge, on the other hand, is regulated by reason. It scientifically explains the facts which have been learned from experience. It arranges those facts, analyses them and shows their connection with general laws or truths.

The child knows that iron rusts if exposed to the air and left unused or uncleaned. The garden gate, the uncleaned bicycle, the water pipe all tell him this. His knowledge is empirical. The Object Lesson or Chemistry Lesson explains the law of oxidation. The reason for the rust is now laid bare. The facts are brought under a chemical law. The knowledge has been made rational.

In each case the child started with individual notions; he set out with examples or concrete cases and passed over to abstract laws; from what was known to what was unknown; from what were simple facts to laws that were complex in their operation; from what was vague and indefinite in its origin and work to more definite knowledge on these points.

**The Heuristic Method.**—This "happy" method has been most unhappy of late in its advocates, who have tried to push it beyond the bounds of reason. It is the method of "discovery," and it demands that a child should find out everything for himself. He is to be told nothing. The teacher may supply the material for the process, but after that the child is to rely entirely on himself. He is to be placed in the position of an original discoverer.

The position is absurd; for if the method is sound it should

be applied generally. The method then becomes antediluvian and demands for its practice an average age equal to that of Methusaleh.

Interpreted rationally the method is both sound and interesting. What a child may discover for himself under reasonable conditions of time, cost and mental profit should be learned by this method; other things should be told, explained or demonstrated to him.

"The best of teachers will tell a class some fact in natural history, when he might have taken them into the fields to observe it for themselves. The fact is wanted then and there; to observe it directly would cost half a day; to omit all mention of it would be to omit a necessary qualification of an important principle which is being worked out. If we are to make our natural science absolutely for ourselves, we must be prepared to spend some centuries upon it" (*Miall*).

**II. Method as Influenced by the Subject Matter.**—In studying a subject one may begin with it as a whole and proceed to its parts, or one may begin with the parts and proceed to the whole; *i.e.*, we may make either the whole or the parts our starting point. Both methods, in their essential forms, are good; both may be right; both may be valuable; and in the treatment of a subject both may be combined. The problem for the young teacher is to know when to use the one; when to use the other.

**1. The Analytical Method.**—This method begins with the whole and proceeds to a study of the parts; *e.g.*, in Grammar, sentences are analysed into their constituent parts; in Chemistry, compounds are analysed into their elements.

**2. The Synthetic Method.**—This method begins with the parts and proceeds to the whole. In an English lesson word-building is a synthetic process; in Chemistry, elements are combined and compounds are formed; Writing and Drawing are also synthetic studies.

In the Analytic Method the maxim which instructs us to proceed from the Individual to the General is reversed. We start with the General and proceed to the Individual. We follow out a general proposition or definition into its particular application; *e.g.* :—

The teacher tells the class that a Pronoun is a word used instead of a Noun. He then applies the definition by asking the class to supply suitable pronouns to sentences which he gives;

or he may ask the class to supply the sentences containing the pronouns. In each sentence given he may then ask which word is a pronoun and why it is thought to be a pronoun.

We are now in a position to summarise all the maxims or methods which have been dealt with in this chapter. There is a common principle running through them, which also appears in the Synthetic Method. The Analytic Method introduces us to what may be called the "return" maxims or methods, *viz.*: the method of proceeding from the General to the Individual or Particular; from the Abstract to the Concrete. The former methods are *Inductive*; the return methods *Deductive*. These are the two great methods of reasoning used by the teacher in his important task of training the minds of young children. We will now compare the two methods.

First Method (Inductive).	Second Method (Deductive).
<ol style="list-style-type: none"> <li>1. Teacher obtains an iron ball which will just pass through a ring. He heats the iron ball and again places it on the ring. <i>It does not pass through.</i> INFERENCE: HEAT HAS CAUSED THE BALL TO EXPAND.</li> <li>2. The experiment is repeated with brass, copper, etc.; all of which are solids; therefore SOLIDS EXPAND WITH HEAT.</li> <li>3. Further experiments are made with liquids and gases. Liquids and gases are forms of matter; therefore MATTER EXPANDS WITH HEAT.</li> </ol>	<ol style="list-style-type: none"> <li>1. The teacher enumerates the principle: MATTER EXPANDS WITH HEAT.</li> <li>2. He argues solids are a form of matter; iron is a solid; therefore IRON EXPANDS WITH HEAT.</li> <li>3. He then proceeds to work an experiment to prove his assertion.</li> <li>4. He argues that liquids and gases are forms of matter, and infers that LIQUIDS AND GASES EXPAND WITH HEAT.</li> </ol>

#### THE CHIEF DIFFERENCES BETWEEN THE TWO METHODS.

<ol style="list-style-type: none"> <li>1. Particulars (<i>i.e.</i>, single cases) were first dealt with and from these particular cases general laws were inferred. This method of reasoning is known as <b>Induction</b>.</li> <li>2. Induction is the method of <i>education</i>.               <ol style="list-style-type: none"> <li>(a) It is an <i>upward</i> movement of thought, leading to definition, rule, principle or theory.</li> <li>(b) It leads to new knowledge.</li> <li>(c) It is the method of discovery.</li> </ol> </li> <li>3. It is a <i>slow</i> method. All knowledge has to be acquired first hand by the observation of particular cases.</li> <li>4. It is a <i>safe</i> method. The general notion or law is reached step by step. Its meaning is well grasped and it can then be accurately applied to new cases.</li> <li>5. It is a method which <i>fosters self-reliance</i>. Children are trained to depend upon their own observation, ideas and judgments.</li> </ol>	<ol style="list-style-type: none"> <li>1. The general law was first enunciated, and particular cases were then shown to be examples of this general law. This method of reasoning is known as <b>Deduction</b>.</li> <li>2. Deduction is the method of <i>instruction</i>.               <ol style="list-style-type: none"> <li>(a) It is a <i>downward</i> movement of thought leading to a more perfect comprehension of the general rule, principle, theory, etc.</li> <li>(b) It does not lead to new knowledge.</li> <li>(c) It is the method of verification and explanation.</li> </ol> </li> <li>3. It is a <i>quicker</i> method than the Inductive. The child avails himself of the knowledge others have acquired.</li> <li>4. It is <i>not so safe</i> a method as the other. The general law may be imperfectly grasped; hence there may be faulty application to new cases.</li> <li>5. It is a method which encourages <i>dependence</i> upon others.</li> </ol>
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A little reflection will show the young teacher that the method of **Induction** "thus begins with facts apparent to the senses, and has the difficult task of detecting those universal laws or general principles which can only be comprehended by intellect. It has been aptly said that the method of Induction thus proceeds *from things better known to us*, or our senses, to those which are more simple or *better known in nature*. The method of **Deduction** proceeds in the opposite direction, beginning with the things better known in nature, and proceeding to show or explain the things better known to us, or our senses. The difference is almost like that between *hiding* and *seeking*. He who has hidden a thing knows where to find it; but this is not the position of a discoverer, who has no clue except such as he may meet in his own diligent and sagacious search."

Such terms as elicit, educe, deduce and inference are often seen by young teachers "as in a glass darkly". They are therefore strongly advised to take a good dictionary and make themselves thorough masters of the meaning of these terms. Assuming that this will be done where necessary, perhaps it will be sufficient here to say that broadly "educer" should be confined to inductive processes, "deduce" to deductive processes, "infer" to both, whilst "elicit" may be applied to either, although not exclusively confined to them.

For the above and for other reasons the young student should keep a set of *note books*, for they will enable him to take down any detail given during the lesson. Such notes come as a great aid to the memory and help the necessary work of recapitulation. They are also a fine aid to concentration, for the attention must be keenly maintained to make "notes" of any value. This is one of their best uses. Then they may develop a power of analysis and condensation, of proper perspective and logical proportion, if the student is trained to reproduce the substance of a lesson in a synoptic form; and thus incidentally the vocabulary may be increased and the power of composition improved. But "notes" must not be abused. As a rule, mere dictation of notes is extravagant in time and almost useless. Notes are only valuable when the class have to reproduce the lesson or lecture by the aid of their own self-made notes. In like manner the copying of notes from a book is a waste of time. The process is purely mechanical, the thoughts of the author being merely transferred from one book to another. But if the student should first read the chapter and

then with closed text-book make an analysis of the subject-matter, the method would bring profit. But in any case copious note-taking is a waste of time and distracting; the memory wants stimulating, not smothering; nor is it good for the mind to depend too much on future reference.

## CHAPTER V.

### METHOD. CLASS TEACHING.

**The Teacher.**—To organise and classify a school well, to educate the scholars to the best advantage, the teacher must be well equipped with suitable qualifications, mental, moral, and physical.

**I. Mental Qualifications.**—The teacher must be well-read, with an ample knowledge of the subjects embraced in the school curriculum. He should prepare his lessons carefully, so that his information may be accurate and precise. If he is to be successful, he must be a permanent student, for the improvement of his own mind, and to keep him in better sympathy with his class. He must be natural in his language, and modest over his acquirements. He should form good intellectual friendships, so that he may rub shoulders with better minds than his own. This will check the too prevalent tendency to pedantry. Teaching requires good descriptive powers, and these should be sedulously cultivated. He must keep pace with the times by bringing his methods up to date, and this can only be done by study and observation.

**II. Moral Qualifications.**—His character must be beyond reproach. No one is more restlessly watched than a teacher; no one is more persistently copied; hence he must guard his *temper* so as to present a cheerful front to his class at all times. "A boy compelled for six hours a day to see the countenance and hear the voice of a fretful, unkind, hard, or passionate man is placed in a school of vice." *Cheerfulness* is as essential as anything. Its association with work is a valuable lesson to the children, for they learn that work need not necessarily mean dullness. The teacher must also be *sympathetic*. Sympathy is contagious and productive, calling forth the respect and esteem of pupils and parents, and making school a happy place. Especially must he form and teach *good habits*, and to do this successfully he must understand the principles upon which habit depends—association, repetition, concentration, and nutrition. All *motives* that influence children for their good must be called into requisition, and his own habits

must be shown to be guided by these principles and influenced by these motives.

**III. Physical Qualifications.**—A teacher should be a fair adept at some of our national games, so that he may maintain his own health and share the games of his pupils. He should be quick of eye and ear, so that it may be known that nothing will escape his notice. His voice should be nicely pitched, pleasant yet authoritative, and in discipline it should be used as little as possible, for a noisy teacher makes a noisy class. His work should also be characterised by energy and zeal, and a healthy body is absolutely essential for this. Such conditions will beget like qualities in his pupils, and bring immediate and future profit.

Knowledge may be imparted by the teacher in the form of the monologue or the dialogue. Both forms will be in constant use, but both forms will depend largely for their value on the personal qualities of the teacher.

**1. The Monologue Form.**—By this is practically meant the "Lecture" form of teaching. Except in the form of the story or narrative it is not suited to young children. Its proper use in the teaching world is for very senior scholars and adults. But in its partial forms of Explanation, Description or Definition it is applicable to all grades of scholars.

By *explanation* in teaching is meant the process of clearing away from a word, phrase or statement all obscurity of meaning, so as to make it intelligible. The meaning is made plain or else it is not explanation. For instance, to most children there is no explanation in calling a glen a dale. By *description* is meant the act of representing a thing by words or signs, or by both. It is a form of explanation. It tries to give an account of the nature, properties or appearance of a thing, so that the children may receive an accurate idea of it. In its best form it is a word picture.

When we define a word we seek to determine its common qualities or marks. We seek to lay bare the whole meaning of the term: *e.g.*, we may define eloquence as "the faculty of influencing the affections of men by means of language". But a *definition* can also be expressed in the form of a proposition, in which case the term to be defined is the subject, and the explanation the predicate; *e.g.*, in the proposition "Man is a food-cooking animal," the term "man" is the subject, and the explanation "is a food-cooking animal" is the predicate. Singular and collective

terms cannot be defined, but they can be described, the description serving the purpose of the definition ; e.g., I may say "George is a short man, dark and stout, a schoolmaster by profession, living in the High Street ". I cannot define George ; I can only describe him. One or two other points need attention. A definition must not contain the name defined ; it must say only what is just sufficient ; and it must not be negative where it can be positive.

**2. The Dialogue Form.**—This form embraces the device of Questioning, the treatment of Answers, Oral Examination and what is known as the Conversational Method of teaching. It is essentially the form for the school and especially for young scholars.

(a) **Questioning.**—Skilful questioning is not easy, nor is it common. Among other things it demands a full and accurate knowledge of the subject-matter, good powers of description and a good logical faculty. This faculty will show itself in the power to recognise the parts of which the whole is composed, to estimate the relative values of those parts and to present them in their right order. It also requires a knowledge of child nature ; which knowledge may be obtained partly from books and partly from observation. The questions must not go beyond the pupils, for that is discouraging ; they must not be beneath them, for that is disappointing. Good questions will fit the average mind of the class exactly. And all this should be supported by a suitable manner. A good question is a testing or teaching gem ; the teacher's manner is the "setting" which adds to the value of the gem.

The objects of questioning are obvious. The questions seek to discover what the child knows, to prepare for new information, to maintain attention and so stimulate mental activity, to introduce variety into the teaching devices used, and to train the mind. Roughly speaking, all questions can be thrown into one of two classes. Their function is either to test or to teach.

*Testing questions* follow teaching and arise out of it. Their function is to measure the individual success of the teacher's and pupil's work ; to find out whether that work is remembered and understood ; and where it needs amending or repeating. They are of a revising nature, and incidentally give good practice in the art of composition, provided the teacher always demands whole sentences and connected sentences as answers.

*Teaching questions* seek to train the mind, to lead it forward to



the discovery of new truths, to cultivate the reasoning powers, to give the child not only mental power, but the consciousness of that power, so as to encourage him to fresh efforts. The functions of the two classes are in nearly every case distinct. The testing question produces a resurrection, the training question a birth; in the former past knowledge is recalled, in the latter new knowledge is revealed. The testing question merely examines, the training question educates and develops; and while the former is primarily for the benefit of the teacher, the latter is primarily for the benefit of the class.

The abuse of questioning must be avoided. Unskilled questioning is apt to destroy connected thinking. A dozen questions are sometimes asked where one should have been sufficient, and the result is that the teacher alone does the connected thinking instead of the child and teacher. Then as a means of acquiring information it may be extravagant in time. Bad forms of it may also stimulate guessing instead of thinking; too much of it may present difficulty after difficulty and so become discouraging and confusing; while in a large class its equitable or judicious distribution is almost impossible. For this reason it may therefore induce speculation. The casually idle or indifferent pupil may speculate on escaping notice.

(b) **Examination.**—This is merely a form of questioning. In its oral form it is questioning pure and simple and is described as *viva voce* examination. But the word "examination" usually implies a written test, and it is this application of the word with which we are most familiar. Both forms have their advantages which will be obvious to any thoughtful student.

(c) **Answering.**—Answers are the natural complement to questions. The proper treatment of answers is therefore an important matter for the young teacher. He should know the characteristics of good answering, answers that should be received, those that should be rejected, and something about the use and value of simultaneous answers.

A good answer will always show thought, although it may not be a ready answer. It will show clearness of expression, correct interpretation, good arrangement, and it will be exact as far as it goes. In the case of a written answer it will also show a proper economy of time, space and language. As a rule, all answers should be given in complete sentences,

Some answers will be received and some rejected. Among the accepted ones will be included all good answers, all honest answers, whether good or not, and partial answers. Here the missing information might be supplied by the class, but any inaccuracy should be corrected by the teacher. Again, the form of the answer may not be that desired, but yet it may be a fair equivalent. In such cases it should be accepted; but the better form should also be placed before the class either by the pupils themselves or by the teacher. Swollen answers should also be received, but the unessential should be stripped from them, and the irrelevant parts pointed out to the class.

The rejected types will include the flippant, the careless and the foolish. A little judicious exposure will be useful, but there should be no snubbing or ridiculing, for educationally the result would be disastrous. Hasty or random answers, including guesses, should be reproved; but at the same time they should receive attention. The motive which made them hasty or random must be sought and the correction applied to that, for the fault may be found to lie with the teacher. Conceited answers may contain a part or the whole of the truth, but in either case the subject-matter of the answer is immaterial. The fault, in such cases, lies not in the intellect but in the character. The answer should either be ignored or the pupil should be questioned further up to the point of failure. The boomerang answer is the fault of the teacher. He is both questioner and answerer, for he answers his own question. He is the sole worker and the class is relegated to the ranks of the unemployed. The cure lies with himself, for the occasions justifying such a method are few. Dishonest answers may arise from ignorance, stupidity or other causes, but the fault is moral rather than intellectual and as such must be treated. "Yes-and-no" answers may be guesses, or they may indicate ignorance, indifference or inattention. The fault may even lie with the teacher through a careless use of "leading" questions. Practically a "leading" question requires nothing more than "Yes" or "No" for an answer, and is therefore a type of question to be avoided.

Simultaneous answering is often attractive to both teacher and class. It has distinct advantages and equally distinct disadvantages. Hence it should be used with caution. It gives a maximum result for a minimum outlay of effort on the teacher's part, since it keeps the whole class at work. It is therefore economical both

in time and effort since it affords a means of rapid recapitulation of the chief points of the lesson. It is also a stimulating process, giving life and "go" to the class and encouraging weaklings to effort; and for this reason it is popular with the class, since it appeals to the juvenile love of activity and affords a welcome variety. Its total effect is to make the children ready both in thought and speech.

On the other hand it is noisy and distracting and offers little mental training in many cases; for it necessarily limits the nature of the questions, which can demand little more than monosyllabic answers. To certain pupils it is a weakening force, for they learn to rely on others. These are mental weaklings. Then again it is often deceptive, for at times there is far more show than reality. It encourages sham or deceit. Under cover of the class noise a lazy or shifty pupil may say something incorrect and so give the appearance of answering; or there may be lip movement without voice. These are the moral weaklings.

(d) **The Conversational Method.**—This device is fully explained by the word conversation. It is free from the cramping effects of formal questioning or examination. It invites expressions of opinion; it does not demand them. It narrows the gulf between teacher and taught, for it allows greater freedom of thought, greater freedom of speech, and greater latitude generally than any other teaching aid. It stimulates mental activity, generates interest, maintains attention and avails itself of much that is charming in conversation generally.

**Characteristics of a Good Lesson.**—Bearing in mind what has already been said the young teacher will be prepared to see that a good lesson must subscribe to certain tests. For instance, are the main points told or discovered? Is each point a problem to the class? Is it clear before the class? Is its difficulty felt? Is all (that can be) pictured out? Is every point illustrated by incident and analogy to make it still clearer and to fit it firmly? Is there a right use of experiments and diagrams? Is there a sifting examination at the end of each point, and a recapitulation of the lesson at its close? Has too much been attempted? Is there a proper use of the B.B.? Is there a well-defined purpose in view? Is the plan of the lesson simple, natural and logical?

**The Criticism Lesson.**—A criticism lesson is really a training lesson for the young teacher. In it he puts forth his best methods

and powers. It is a special effort; the summit of a teacher's skill and nerve. It is a composite and difficult production, requiring for its success a theoretical and practical knowledge of teaching; the aid of a good conscientious head teacher; a certain amount of knowledge of child mind, character and life. Usually, it should follow a *Model Lesson* given by the Head Teacher or some well-qualified Assistant. A model for imitation is an aid worth more than all information gained by reading and lecture; and above all, it bestows confidence. It should embrace all the school subjects.

The criticism should be two-sided; it should expose the weaknesses and commend the excellencies; that is, if it is destructive, it should also be constructive. Where methods are condemned, better methods should be suggested. Commendations should be reasonable and the reasons for the praise should be given. Then the criticism should be short and pointed, for there is no compulsion to deal with every portion of a lesson. Besides, the power to criticise well and in detail will grow with experience and knowledge; but all first efforts should be simple and directed towards the more essential parts of the lesson. An aid in the shape of a criticism form should be used. No special form need be committed to memory. A form devised by the student himself will be of more value educationally than any copied from a text-book; for such forms must of necessity be stereotyped and therefore not suited to all lessons. The form should receive its shape from the lesson, not the lesson from the form. Finally, the form should not be crowded with too much detail or the criticiser becomes a slave to it. The following form is not offered as a model for all lessons. It is simply a graphic suggestion to the young teacher to draw up his own.

## CRITICISM FORM.

No.	Subject, etc.	Matter.	Method.
1	Subject - - - - -		
2	Class or Average Age - -		
3	Time - - - - -		
4	Apparatus - - - - -		

No.	Teacher.	No.	Class.
1	Manner - - - - -	1	Attention - - - - -
	(a) Voice - - - - -	2	Interest - - - - -
	(b) Gesture - - - - -	3	Discipline - - - - -
	(c) Position - - - - -	4	Intelligence - - - - -
	(d) Temper, etc. - - - - -		
2	Language - - - - -		
3	Questions - - - - -		
4	Recapitulation - - - - -		
5	Experiment and Illustration - -		
6	Blackboard - - - - -		

**The Literature of Method.**—From what has already been said it will be seen that successful class teaching is the product of several factors, which include practice and theory. For the production of an efficient teacher both are essential, the one being the advisable complement of the other. The first cannot be neglected; the second should not be. To learn everything experientially is slow and cramping; it may or may not be safe, but it is progress mainly by the mere monkey method of imitation. It produces a race of teachers who are nought but empirics, teachers who do not read educational literature, who pick up a minimum of new ideas and who regard that minimum with suspicion and disfavour; teachers who are satisfied that they are efficient, and whose professional satisfaction sometimes means professional stagnation. A well-known professor of education has described the elementary teacher as an arrogant and intolerant empiric, and it is feared, in many cases at least, with some amount of justice. This is to be regretted. The teacher's experience and his technical knowledge should not be limited by the four walls of any school, however famous that school may be; nor by the professional capacity of any staff, however efficient it may be. As soon as a youth is old enough to teach he is old enough to read and to think about his profession. Mere practice alone will never save him from the stigma of undiluted empiricism. Educational literature,

periodical and otherwise, should be read and studied so that he may ever be abreast with the foremost ideas, the latest developments, the newest theories on the subject. Nor should the reading be confined to books on "Method" only. Methods are the progeny of principles, and the principles of education will need equal attention, if originality is to be stimulated in the practical field of school work. Arrogance and intolerance of the views of others must be no characteristic of our future teachers, however much or little it has been true of them in the past. The reading of suitable books on education is both stimulating and suggestive, and a few hours' reading may, and probably will, yield a larger crop of progressive and valuable ideas than a few months or a few years even of purely experiential knowledge.

The supply of books, where incomes are limited, is important. Each teacher should possess a small pedagogical library at least, and this might be supplemented from other sources. The school, the college and the public free library might all be brought under contribution, so that the course of professional reading so essential and so strongly recommended may be continuous, broad and thorough.

#### EXAMINATION QUESTIONS.

- 1.—State what use you have made of note books and exercise books, and how such books ought to be kept.
- 2.—In what way may success in class teaching be promoted by studying the characters of children?
- 3.—What is the best method of examining a class? What kind of questioning should be avoided?
- 4.—Why is it necessary to get children to connect, as a whole, the separate details they have learnt in an oral lesson, and how would you endeavour to effect this?
- 5.—The answers given by children to questions are too often confined to single words. Why should this be objected to, and what means can be adopted to encourage children to make complete statements and sentences of their own?
- 6.—In criticising a lesson given by a teacher, what are the special points to which attention should be directed? Give some rules for judging of merits and defects, and for forming a just estimate of the success of a lesson.
- 7.—What are the advantages and disadvantages (if any) of encouraging the scholars to put their own questions at the end of a lesson?

*This chapter is continued in the Appendix.*

## CHAPTER VI.

### OBJECT LESSONS.

"It has been observed that in schools in which Object Teaching has been introduced with most success, the teachers have carefully distinguished between two kinds of instruction, which in other schools are not seldom confused. These two kinds of instruction are—(1) observation of the object itself; and (2) giving information about the object. This distinction is of importance, because the scope and method of the lesson differ according to its nature. Object teaching leads the scholar to acquire knowledge by observation and experiment; and no instruction is properly so called unless an object is presented to the learner so that the addition to his knowledge may be made through the senses."

"Junior teachers have not unfrequently given lessons before H.M. Inspectors which were wrongly described as object lessons, because in dealing with the topic selected no suitable appeal was made to the eye of the scholar. A lesson, for example, on the elephant to children in village schools, who have no opportunity of visiting either museums or zoological gardens, may convey information and store the memory with interesting facts; but it does not cultivate the habit of obtaining knowledge directly and at first hand, or develop the faculty of observation. However well the lesson may be illustrated by diagrams, pictures, models, or lantern slides, if the children have no opportunity of handling or watching the actual object which is being dealt with, the teacher will be giving an *information lesson*, rather than an object lesson. It should be always remembered that in object lessons the imparting of information is secondary to the cultivation of the faculty of observation."

"Object teaching should further be distinguished from *instruction in natural science*. It is *elementary science* only in so far as it aids the child to observe some of the facts of nature upon which natural science is founded; but as it deals with such topics with-

out formal arrangement, it differs widely from the systematic study of a particular science. The principles of scientific classification, the continuous study of one group of natural phenomena, the generalisation from facts and the search for natural laws, belong to a later stage of mental discipline, which will be much more effectual if it is being based upon the preliminary training of the senses through sound object teaching. It is most important, therefore, that if, for example, object lessons are given on plant life, no attempt should be made to treat them as a continuous introduction to the study of botany, or, if the lessons relate to animal life, to the study of zoology. In object teaching the chief interest in the lesson should centre in the object itself."

### Suggestions.

1. The teacher should select only so many of the objects set forth in the appended or other similar lists as can be dealt with in the year without overburdening the scholars. Habits of observation are better cultivated by the thorough examination of a few objects than by the superficial treatment of many.
2. *No object should be chosen which the teacher cannot thoroughly illustrate* either by the object itself or by some adequate representation of the object, or by both. All that is purely technical, whether in the mode of study or the language and terminology, should be carefully avoided.
3. The children should be encouraged to bring with them to the lesson *illustrative specimens* which they have collected or borrowed from friends.
4. The children should be encouraged to make *simple drawings illustrative of their observations*, wherever possible, and in certain cases to make simple records on square-ruled paper. *Clay modelling and other manual occupations* may be employed to test the accuracy of the impressions which the children form, and to fix them in their minds. Teachers should also frequently illustrate details of the lesson by *B.B. drawings*. Children who are jaded in five minutes by a lecture will be open-eyed and receptive for half an hour while the teacher draws as well as talks.
5. *Visits to museums* and other institutions of educational value are now recognised by the Code, and may advantageously be undertaken where possible in connection with the object teaching. Occasional *class excursions* out of school hours (or, if the instruction be in accordance with Article 12 (f) of the Code, in school hours), under proper guidance, will enable teachers both to provide suitable objects and to confirm previous impressions. It should be borne in mind that objects when they are brought into the class room cannot be there studied under their ordinary conditions, and therefore it is important by a proper use of such expeditions to let the children see what part the object plays in its usual surroundings.
6. If the scholars are to learn intelligently from their object lessons, *the first requisite is trained attention*. The right method of securing this is to direct, in a conversational way, the attention of the children to the different parts of the object in an orderly manner, and explain the relation of each part to the whole. After the analysis or study of separate detail, the object should again be treated as a whole. It should not be left in fragments, but the division into parts should be followed when possible by the reconstruction of them into their original



unity. Through such teaching the vague and indefinite impressions which the children receive from objects when they are first presented to them are gradually converted into clear mental pictures.

7. "The attempt to teach children to be accurate in observation cannot be separated from the need of making them *accurate in description*. After the children have been trained to observe a fact, they should be practised in making a correct statement of it in a sentence of their own. This oral answering in complete sentences will lead to correct use of the English language, both in talking and writing, and will store the mind with a useful vocabulary. In the higher standards, the children will be able to write brief weekly compositions in which they may express in a written form the ideas which they have acquired through oral instruction." — *Circular 369*.
8. The lesson should be previously well thought out, the subject matter should be *logically arranged*; the *illustrations* should be varied and suitable; there should be a proper use of *experiment*; the childish love of *activity* should be used; the *personal qualities of the teacher* must include tact, sympathy, and patience, and his language and questions must be suited to the capacity of the class; the *sequence of teaching* must be observed, and the method of teaching must be *psychological*; *i.e.*, the lessons should exercise the *senses* chiefly at first; the *conceptive faculty* next; and the *reasoning faculty* last.

### Their Value.

#### I. Principal Uses.

1. The first and most important is to teach the children to observe, compare, and contrast.
2. To impart information.
3. To reinforce the other two by making the results of them the basis for instruction in language, drawing, number, modelling, and other handwork.

#### II. Minor Uses.

1. Object teaching makes the lives of the children more happy and interesting by opening up an easily accessible and attractive field for the exercise of brain, hand, and eye.
2. It gives the children an opportunity of learning the simplest natural facts, and directs their attention to external objects, making their education less bookish.
3. "It develops a love of nature and an interest in living things, and corrects the tendency which exists in many children to destructiveness and thoughtless unkindness to animals, and shows the ignorance and cruelty of such conduct. The value of the services which many animals render to man should be dwelt upon, and the importance of kindly treating them and preserving them should be pointed out." — *Circular 369*.
4. Whilst training the intelligence generally, they especially afford a fine medium for the training of the senses, and in so far as the first of the principal uses does not include this, it should be counted in that category. It also aids the teaching of the abstract by the concrete, and arouses a healthy curiosity.
5. Object teaching has also a moral use. It helps to form good habits which have a beneficial influence on the lives of the children when school days are over. It helps to develop a higher moral tone, for the beauties and marvels of nature, exemplified in everything around them, must tend to produce feelings of wonder, reverence and gratitude to the Great Author of all.

6. Object lessons encourage a tendency to self-reliance in children, and in developing this tendency they do not seek so much to give information as to help the children to get information for themselves. They not only teach children to see things instead of merely looking at them, as is pointed out under their principal uses, but they teach them to decompose the confused aggregate of impressions which things "at first make upon the mind; to get them to classify and to generalise and to connect simple phenomena with their antecedents and consequents; exercise the reason; and to do this in Nature's own way, by bringing the learner as far as possible into direct contact with things, and satisfy his own instinctive needs".

### **The Training of the Senses.**

One of the primary objects of object teaching is the proper training of the senses, especially of sight and touch, which are pre-eminently the intellectual senses. The importance of sense training is further recognised by the admission of hand and eye training, kindergarten and its developments, drawing, clay modelling, and manual instruction into the school curriculum. All these exercise the senses in a number of ways, and so supply the materials of knowledge; for there can be neither a wide nor an accurate knowledge of the world around us without *the proper exercise of the senses through material objects*. This is the first and most important element in the training of the senses.

Having presented proper materials in a suitable variety, the teacher next teaches the children *to observe* objects as distinct from mere sight sensations. Points which would escape the cursory glance of most children are detected with the teacher's aid, and an effort is made to *stimulate curiosity* and *arouse interest*. The children are invited to handle the things for themselves and to examine them. As much *movement* as is consonant with proper discipline is also allowed the children, so as to bring the feeling of muscular movement to the aid of sense impressions. The fixing of associations of this kind is not only necessary but valuable. The child's *activity* is thus utilised to the best advantage in allowing him to use his hands and his eyes in investigating the things supplied to him; and it must ever be remembered that it is only in this way that real sense knowledge is ever acquired; that is, *in bringing the mind in contact with things immediately*, and not mediately, through the intervention of another mind, whether it be the teacher's or that of any one else.

The objects presented should be *graded* and then placed in *juxtaposition for comparison and contrast*. In teaching colour the simple colours should be first examined, then the compound, and

finally, shades of the same colour. Striking differences should always be first dealt with, the less obvious ones following in accordance with their difficulty of discrimination. A child will learn to distinguish the elm and the cedar more easily than the oak and beech.

There must also be a certain amount of *repetition* to ensure familiarity and easy identification. Without this no habit of close examination can be formed, and no deep interest can be aroused. We are rarely, if ever, deeply interested either in mere passing objects, events, or acquaintances.

The method of the lessons must be such as to cultivate the *attention*, and to train it to fix itself upon what is present. Concentration is a form of genius, and to secure this the training must be such as to enable the child to turn its attention voluntarily to the object under consideration.

The *play* of the child should be utilised. This is the underlying principle of all kindergarten instruction which recognises the fact that a child never tires of a building box, whilst the clay modelling of the school is only an educational application of the mud pie of the gutter.

*Observation* should be utilised in every possible branch of school work. Models, diagrams, pictures, and the various forms of apparatus have all sprung into existence in recognition of this fact. But there must be *no hurry* in any stage of the process, for where there is no firm grounding of sense knowledge, all after knowledge is limited. "Imagination will be hazy, thought loose and inaccurate, where the preliminary stage of perception has been hurried over."

### SCHEMES OF OBJECT LESSONS

FROM CIRCULAR 369.

The following lessons deal with the ordinary phenomena of common life and with objects familiar to the children. The teacher's choice is not confined to these lists; other objects will be accepted subject to the approval of the Inspector. Any of the objects may be dealt with at the discretion of the teacher in more than one lesson; and although they may have been grouped for convenience of reference, it is not intended to prescribe any specified number of them for a yearly course. With different treatment the same object may be adapted to more than one standard. Some teachers may prefer to deal with the same object in successive years, or to recur to it after a year's interval, expanding the study to suit the growing powers of the scholars. To meet the varying requirements of teachers it will be noticed that in some cases the names of the objects have been merely enumerated, while in other cases a few suggestions have been added as to the mode of treatment.

I. PLANT LIFE.

(a) **The Study of Plants as Growing Things.**

1. Grow an *onion* in a bottle of water, and note appearance of root and stem. Make a model in clay of the various stages of growth at short intervals.

2. Grow *mustard seed* on damp flannel, and note stages of growth.

3. Notice a few curious roots.

(1) *The Carrot*.—Cut off the top of one and grow it in a saucer of water. Contrast the root of a daisy (fibrous).

(2) *Roots which Walk*.—Strawberry or strawberry.

(3) *Violet Root*.

(4) Contrast root of *Iris* and *Solomon's Seal* in their modes of extension.

4. *Stem*.—Count the rings in a trunk that has been felled. Rings, how produced: the record of wet or dry seasons.

*Climbing Stems. Ivy*.—Train bindweed up a stick, and note that it turns to the right. If you unwind it and force it the other way (to the left), note how it resumes its old direction again, holding the stick with one of its leaf stalks to get a purchase for the change.

5. Simple experiments to show effect of light on (1) leaves, and (2) roots. Celery; blanching.

6. *Leaves of deciduous trees* contrasted with leaves of evergreens. Contrast leaves of holly, ivy, and box with leaves of oak, elm, and beech.

Note autumn tints. Collect and press leaves of various colours in autumn.

7. *Buds*.—Leaf buds and flower buds. Parts of a flower.

8. *Fruits*.—Different kinds.

(b) **Blossoms, Fruits, Seeds, and Leaves.**

*Parts of a flower.*

*Flowers of curious shape.*

*Pea blossom.*

*Insects and flowers.*

*Colours of flowers and insects.*

*Fruits*.—How seeds are scattered.

*Shooting seeds.*

*Flying seeds.*

*Curious flowers, e.g., primrose, compound flower (daisy), water lily.*

*Leaves*.—Shape, veining, arrangement.

*Flowers as supplying—*

(1) Weather glass.

(2) Clock.

(3) Calendar.

(c) **How Plants are Adapted to their Surroundings.**

*A bunch of spring flowers* (according to time of year).

*A bunch of summer flowers* (according to time of year).

*A bunch of autumn flowers* (according to time of year).

*Flowers and the soil*.—Bog plants.

*Riverside plants.*

*Plants that grow in running water.*

*Plants that grow in still water.*

*Meadow plants.*

*Plants of the heath and moor.*

*Plants of the hills.*

*Plants of the wood.*

*Plants of the sea coast and salt marshes.*

*Sundew and flesh-eating plants.*

*Ferns.*

*The Spores of Ferns*.—Grow some spores in a pan under glass and watch growth and development of fern. Contrast with growth of mustard from seed.

*Mosses.*

*Lichens.*

*Funguses.*

Simple experiments in manuring plants.

How plants help or hinder each other's growth.

*Parasites*.—Mistletoe.

Plants which help or injure man.

II. ANIMAL LIFE.

(a) *The Cat* (compare with dog).—Eyes, rough dry tongue, soft pads and sharp claws, teeth, method of holding prey, drinking, covering of fur, whiskers, tail.

*The Cow* (compare with sheep and goat).—How she takes her food, teeth, chewing, milk (cheese and butter), tail, hoofs, covering, ears, horns, nose.

*The Horse* (compare with donkey).—Covering, teeth, hoofs, tail, mane.

*The Rabbit* (compare with hare).—Teeth, legs, feet, claws, covering, tail, whiskers, ears, eyes.

*The Mouse* (compare with rat and water rat).—Teeth, paws, tail, whiskers, eyes, ears.

*A Fish*.—How fitted to live in water, weight, shape, covering, temperature, movements.

*A Plaice* (compare with herring).—Flat, eyes on one side of head, gills, movements.

*Animals which sleep in winter*.—Examples: Squirrel, dormouse, common snake, frog, toad, snail, slug. Preparation made for sleep.

(b) *Mole*.—Shape, snout, teeth, paws, claws, eyes, ears, fur, food.

*Hedgehog*.—Covering of spines, how it rolls itself into a ball and why, head, teeth, food.

*Common Snake* (compare with viper).—Shape, covering, teeth, how it moves, how it swallows its prey.

*Frog* (compare with toad and newt).—Movements, capture of prey, breathing, winter quarters.

*Garden Snail* (compare with slug).—Shell, mantle, head, horns, eyes, food, preparation for winter sleep.

*Earth Worm*.—Shape, rings, locomotion, food, usefulness.

*Spider* (contrast with bee).—Shape, seg-

ments, legs, eyes, jaws, spinnerets, web, breathing organs.

(c) *Paws and Claws and their uses.*—Cat, dog, rabbit, mouse, mole, frog.

*Tails and their uses.*—Horse, cow, dog, donkey, cat, monkey, harvest mouse.

*Tongues and their uses.*—Cat, dog, cow, woodpecker, frogs.

*Teeth and their uses.*—Man, cat, cow, horse, rabbit, snake, fangs of poisonous snakes.

*Hair, Fur, Wool and their uses.*—Cat, mole, dog, sheep, fox.

*Beaks of Birds and their uses.*—Duck, fowl, parrot, sparrow, goat sucker, heron.

*Feet of Birds and their uses.*—Duck, fowl, swift, owl, etc.

*Insects.*—Examples: Bee, beetle, butterfly, cockroach, silkworm. Insect development, legs, wings, segments, mouth, breathing apparatus, ovipositors.

### III. THE SKY, THE AIR, THE SURFACE OF THE LAND, AND WATER.

#### (a) The Sky.

*Sunrise, Noon, and Sunset.*—(Note the object over which the sun is seen to rise from mouth to month. Note sun's position at noon, and its varying height above the horizon.)

*Shadow.*—(Note, by aid of a spike erect on a flat disc, the varying length of the shadow at noon. Study the shadows of objects, variation in sharpness and depth.)

*Moon.*—(Note the changes. Draw the shape from week to week.)

*A few of the Brightest Constellations.*—(Make diagrams on square ruled paper from a study of the sky itself. Great Bear and Pole Star, Lyre and Vega, Cassiopeia.)

*Planets.*—(Note any planet visible when the lesson is given. Mark its position on square ruled paper for a few weeks.)

*Varying length of Day and Night.*

#### (b) The Air.

*Wind.*—Varying direction. (Note and keep record of the direction of the wind from day to day.)

Warmer and colder winds; rainy and dry winds.

*Moisture in the air* shown by seaweed, string (changing tension).

Wet cloth dries in the wind (water turns to vapour).

Vapour turns to water. (Breathing on slate. Clouds on hills. Evening mists.)

Clouds in the sky. Three chief kinds: "Heaps," "beds," "feathers".

*Rain.*—(Note size of drops. Raindrops on dust form little balls. Note effect of heavy rain in tearing up roads. Note the channels so made, and the arrangement of the sand and pebbles washed to a distance.)

*Rainbow.*—(Note the succession of colours. Note position of the sun behind observer and of the bow where the shower of rain is falling. Note that height of arch changes. When is it higher and when lower?)

Rainbow colours on shells, film of tar, etc., feathers of birds.

*Dew.*—(Note when formed. Cloudless weather. On what does it lie thickest?)

*Hoar frost.*

*Snow.*—(Note size of flakes. Movement of flakes in the air as they fall. Snowdrift. Snow squeezed into ice.)

*Hail.*—(Note when it falls. Examine hailstones. Is the hail accompanied by thunder?)

*Thunder and Lightning.*

#### (c) The Surface of the Land.

*Level or Sloping.*—Simple way of measuring slope. Height of school and neighbouring hilltops above sea level.

*Flow of Water over the Land.*—Neighbouring stream or streams. Water partings.

The river basin in which the school is situated.

Construct a model fountain and make simple observations on the pressure of water. Milldam. A head of water. Notion of falling water as a motor.

*Soils.*—Clay, sand, slate, granite, chalk, quarries near school, gravel pits, clay pits, brick works. (Note how the rocks lie, in layers or in masses without structure.)

*Stones* in the brook, water-worn; pebbles on beach, rounded; pebbles in gravel pit, often with sharp edges, perhaps ice-borne.

Difference between sand and mud.

*Crumbling Rocks.*—Effect of frost on damp rocks.

*Caves* by the sea formed by the waves. Caves inland formed by rain dissolving limestone, stalactites. (A lesson for schools in limestone regions or near rocky coasts.)

*Building Stone.*—Marble, slate, bathstone, sandstone, etc.

In marble, note shells, etc. Note plants in coal.

*Volcanic Rocks.*—Lava, brimstone, pumice stone, basalt or whinstone. (According to the nature of the district.)

*Rock Salt.*—Crystals of salt. Salt in sea water. Mineral in solution.

*Hard and Soft Water.*—Rain water compared with streams from chalk or limestone. Leavings after evaporation. Fur in kettles. Softening hard water.

(In certain districts) other minerals in solution. Sulphur wells, iron springs, medicinal waters.

*Mortar and Cement.*—(Slake lime and make mortar; note the heat, etc.)

*Surface Soils.*—Crumbled rocks. Water-borne sand and mud. Vegetable mould and earthworms.

*Vegetation and Cultivation.*—Forest, moor and heath, heathers.

*Hedgerow Trees.*—Elms, ashes.

*Trees of the Forest.*—Oak, birch, beech. Evergreen trees: Pines and firs.

*Evergreen Plants and Shrubs.*—Ivy, holly, box. Contrast evergreen and deciduous leaves. (Note changes at fall of leaf. Autumn tints. Press specimens.)

*Riverside Trees.*—Willows, poplars, aspens.

*Hill Pastures and Meadows.*—Turf on the downs and hay in the valleys.

*Gardens and their contents.* Garden fruits and wild fruits. Garden flowers and wild flowers.

#### (d) Water.

*Standing Water.*—Ponds, pond life.

*Springs and Running Water.*—Clear water looks shallower than it is. Simple experiments in illustration.

*Study of Flow of a Stream.*—Where the flow is quicker, (a) in the middle, (b) on one side, outer and inner bend. Where the bank is eaten away and where sand is spread out. Varying bottom, deep pools, shallows, sand banks. Confluence of tributary. Delta. Measure the speed at which the water flows.

*Study of Sea Shore.*—Rocky and sandy coasts. Soundings. The rise and fall of the tide. Currents. Drifting sand. Effect of frost on cliffs. Breakwaters. Layers of soil and rock exposed down the side of a cliff.

Measure with thermometer the temperature of (a) a spring; (b) a stream; (c) a pond; (d) the sea.

*Ice.* Study hardness, mode of fracture, splitting blocks with a needle. Does it sink or swim in water? Easy to make two surfaces of ice freeze together. Simple experiments with ice.

Watch and record behaviour of thermometer plunged in melting ice.

Melt some ice carefully to find out whether

it takes up more or less room than the water into which it changes. (Force a mass of ice into a lump of clay, and let it melt there.)

Freeze some water in a bottle, and note bursting of bottle. Bursting of pipes.

Notes on *expansion and contraction of substances* illustrated by behaviour of water at different temperatures. *Preliminary notion of thermometer.*

Watch cold spring water being heated to boiling point in transparent glass vessel. Note bubbles of air given off, and as the water is heated bubbles of steam rise from below. Observe force of compressed steam. *Preliminary notion of steam engine.*

Dribble powdered alum into clear water. Hang thread in the solution, and note the formation of crystal. Alum and other crystals.

Expose to the air crystals of (1) salt; (2) soda. Note change. What difference? What difference according to weather? Expose to the air crystals of saltpetre, and note result.

Dribble salt into clear water and note that it *dissolves*, quicker at first, then slower. At last no more is dissolved. Place a fresh egg in saturated solution, and afterwards transfer it to clear water.

One liquid is *denser* than another. Compare water and mercury. Things which float in mercury and sink in water.

*Upward pressure of water* on bodies dropped into it. Why bodies sink or float. Why steel ships float. Why cork floats.

*Simple experiments in displacement of water.*

*Simple experiments in pressure of water and pressure of air.* Siphon, squirt, pump, diving bell.

*Distillation of water. Filtration.*

*Water, a combination of two gases.* Oxygen and hydrogen. Simple experiments.

#### IV. OBJECT LESSONS FOR TOWN SCHOOLS.

(a) *The water we drink.*—How obtained. Some of the simpler properties of water.

*River (or canal).*—According to circumstances.

*Boats, barges, or ships,* with which children are familiar.—According to circumstances.

*Other ships, e.g.,* Atlantic liners.

*Bricks.*—Their size, shape, and manufacture; their size, etc., to be ascertained by children's measurements.

*Bricklayer's work.*—Arrangement of bricks in 14-inch wall and 9-inch wall, shown with real bricks or with small wooden ones; mortar, etc.

*Coal.*—Its simpler properties.

*Coal.*—How obtained.

*Coal.*—How transported and how used.

*Coal gas.*—It may be made in the presence of the children.

*Gas works and gas pipes.*

*Petroleum.*—How obtained; its simpler properties and uses.

*Lamps and their dangers.*

*Common stones* used in building and road-making.

*Roadmaking and paving.*

*Quarries and quarrymen.*

*Railways.*—General sketch.

*Engines and carriages.*

*The work of railway men.*

*The park or public garden.*—One or two of its more conspicuous trees.

*The park or public garden.*—One or two of its more conspicuous plants.

*Comparison between calico and flannel.*

*Cotton and its manufacture.*

*Lancashire and the cotton district.*—Mills.

*Sheep clipping and rearing.*

*The West Riding of Yorkshire; factories,* etc.

(b) *Cart horse.*

*Donkey.*

*Sparrow.*

*Rat or mouse.*

*Cat.*

*Plants grown in schoolroom.*—(Aconit in

glass of water; mustard and cress; hyacinth in water or pot; fern.)

*Custermonger*, and what he sells.

*Some common fruit sold in streets or shops, e.g.,* pears and apples, strawberries, oranges, coconuts.

*Things seen in a grocer's window, e.g.,* tea, sugar, coffee, currants, and raisins.

*The baker and his work.*

*The milkman.*

*The addressing and posting of a letter.*

*The postman and Post Office.*

*The sweep and his work.*

*Dangers from fire*, and how they may be avoided.

*The fireman and fire engines.*

*Bus or tram drivers.*

*The policeman.*

## V. OBJECT LESSONS FOR COUNTRY SCHOOLS.

(a) *The farmyard.*—Its buildings and their contents. Animals kept on a farm and their uses. Necessity for cleanliness, kindness, and suitable food.

*The dairy and its contents.*—Butter and cheese making.

*Bees.*—Bee keeping.

*Spring.*—Spring flowers. Work in the fields in spring. The cuckoo and swallow. Record date of arrival.

*Summer.*—Different kinds of leaves and fruit. Work in the fields in summer.

*Autumn.*—Work in the fields.

*A mill and the work of a miller.*

*Winter.*—Frost, ice, snow.

*Birds.*—Singing birds, as the thrush and nightingale. Birds of prey, as the hawk. Swimming and wading birds, as the duck and heron.

*Wild animals.*—The fox, the hare, and rabbit.

*Minerals.*—A mine. Three useful minerals.

The lessons on the seasons should correspond with the actual seasons of the year, and the different operations explained should be taken while each is in progress.

Leaves of trees may be dried by simply placing them between sheets of paper and pressing them. Their shapes may be used for the children to draw round on paper, which can afterwards be pricked and then sewn round.

(b) *Springtime.* { The waking of Nature; the lengthening daylight in the morning and evening; the coming warm weather; birds singing, building their nests, laying their eggs; the trees and hedges changing; buds and leaves; the bloom on fruit trees.

*The local wild flowers of spring.*—The daisy, primrose, bluebell.

*Summer time.*

*The local wild flowers of summer.*

*Autumn.*

*The local wild flowers of autumn.*

*Winter.*—The repose of nature.

*The land.*—Woodland, meadowland, ploughland, moorland.

*The sky.*

*A bird.*—Covering, wings, beak, feet, motion, nests, eggs, food.

*Local birds.*—Thrush or blackbird, lark, robin, rooks.

*Birds which come for the summer.*

*Birds which come for the winter.*

*Local wild animals.*—Rabbit, hare, fox, hedgehog.

*Animals on a farm.*

*Our village.*

*The carrier's cart.*

*The cottage garden.*

*The stream or river.*—Its banks; the birds and animals that live near it.

*A fish.*

*A plant.*

(c) *The garden and farm in the four seasons of the year.*

*The weather and wind.*

*The soil.*—Sunshine, air, rain, frost, manure.

*The farmer's tools.*—The plough, drill, reaping machine.

*The crops.*—Grass, corn, root crops.

*Wheat.*

*The potato.*

*Trees.*—Oak, elm, apple, evergreen trees.

*An insect.*

*The spider and his web.*

*The butterfly.*—Colours, beauty, history.

*Bees*

*The farmer's pests.*

*The farmer's friends.*

*A pond.*

*A frog.*

*A ramble in a wood*, and what may be seen there.

*The railway.*

*Market day in the neighbouring town*

*A newspaper.*

## VI. OBJECT LESSONS IN THE SCIENCE OF COMMON THINGS.

(a) *Water.*—How carried: jugs, bottles, barrels, spouts, funnels. Wells. Things that float: things that sink.

*Solids.*—Hard and soft, in the room and in clothing. Files, hammer and nails, buttons.

*Powders.*—Flour.

*Pastes.*—Paste, clay, putty.

*Things porous.*—Bread, sponge.

*Things that melt.*—Butter, tallow, sealing wax, ice, snow.

*Water.*—Drying clothes, breathing on

slates, frost on pane, the boiling of the kettle, the pot boiling over.

*Things that dissolve.*—Sugar, salt.

*Air.*—Bubbles, pouring water through funnel into empty bottle. A burning candle. Fans, blowing feathers, paper windmills.

*Forms of strength.*—The floor, joists, and boards. Wooden bridges. Steps and stairs.

*Things that stretch.*—Elastic bands.

*Things that bend.*—Bow and arrows, cord ropes.

*Machines.*—Tops, roller for pastry, for garden, perambulator.

*Movements.*—Walking, running, leaping, creeping, crawling.

*Musical toys.*—Harmonicon, bell.

(b) *Water.*—Pipes, taps, the fountain, canals, rafts, boats, anchors.

*Solids.*—Teeth, nails, and claws, sand paper, pins, needles, awl, gimlet, hook and eye.

*Powders.*—Chalk, pencil.

*Pastes.*—Mud in streets, brickmaking.

*Things porous.*—Brick, chalk, springs of water.

*Things that melt.*—Candlemaking, icicles.

*Water.*—Manufacture of salt from brine. Raindrops, hail, spray, water dust, the cloud.

*Things that dissolve.*—Manufacture of sugar.

*Air.*—The chimney, draughts, waves and

breakers, winged seeds, shuttlecock, arrow, and kite.

*Forms of strength.*—The ceiling, the arch, ladders.

*Things that stretch.*—A football.

*Things that bend.*—Cart springs, paper clips, spider's web.

*Machines.*—Hoop, fly-wheel of sewing machine, mangle, waggon, bicycle.

*Movements.*—Swimming.

*Musical toys.*—Musical box, drum.

(c) *Water.*—Siphon, pump, oil, cream.

*Solids.*—Hinges, tires, and axles. The grindstone. Screws and screw-drivers

*Powders.*—Black lead.

*Pastes.*—Pottery.

*Things porous.*—Blotting paper, towels, wick, earth.

*Things that melt.*—Lead, iron.

*Water.*—Salt lakes. Distillation of water. Clouds and rain.

*Things that dissolve.*—Crystals, hard water, varnishes.

*Air.*—The pop-gun, the fire engine, winds, a sailing ship.

*Forms of strength.*—The roof, railway bridges, cranes.

*Things that bend.*—Clock spring, chains.

*Machines.*—The loom, threshing machine, rolling iron rails, coining.

*Movements.*—Flying.

*Musical toys.*—Tin whistle, sounds from stretched cord.

## VII. MEASURING, WEIGHING, AND TESTING.

*A two-foot rule.*

*Measurements* (in inches only). Of length—first by eye, then with rule. Easy measurements of a square—first by eye, then with rule.

Easy measurements of rectangles.

*The wire-gauge.*

*Callipers.*

*Scales and weights.*—Weighing of common objects—first by hand, then with scales; weight in ounces only.

*Weighing letters.*

*Plumb line.*

*Spirit level.*

*Steam.*—Observations on boiling water; condensation of steam, etc.

*Mercury.*—Weight of; cf. drop of mercury and drop of water; effect of heat on mercury.

*Alcohol.*—Effect of heat on it; its evaporation.

*Thermometer.*—Manufacture, uses, readings in ice, in boiling water, under the tongue, in schoolroom.

*A candle.*—Its composition, the wick.

*Candle* under bell-jar over water; candle in narrow-necked bottle.

*Chalk.*—Where found; its origin.

*Chalk.*—Its treatment with acid.

*Chalk.*—Its reduction to quicklime with blow-pipe; lime water.

*Sugar* heated in test tube; *wood* heated in test tube

*Sulphur* heated in test tube; *lead* heated in test tube.

*Magnet* and iron filings.

*The compass.*

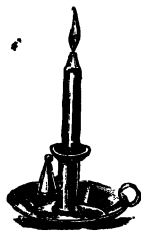
Two illustrative lessons now follow.



## CANDLE. FOR STANDARD I.

*Things required*—Candles, matches, fire, lamp, paper, slate, spoon, small sheet of glass, lard, butter.  
(The Lesson should be given in a darkened room or a dark day should be chosen for the Lesson.)

Observations and Experiments.	Results.	Inferences.
1. (a) Drop pin on floor; ask child to find it. (b) Light candle to assist search.	Pin cannot be found. Pin can now be found.	<b>Room is too dark.</b> <b>Candle gives Light.</b>
2. Blow out candle, light lamp, gas, etc.	Things can again be seen in room.	<b>Lamp, Gas, also give Light.</b>
3. Re-light candle; ask child to put hand nearer and nearer candle flame. Repeat with fire.	Hand becomes warmer.	<b>Flame is hot. The nearer anything gets to flame, the hotter it becomes.</b>
4. Bring piece of paper and match nearer and nearer candle and fire.	Paper and match catch fire.	<b>It is dangerous to go too near anything burning.</b>
5. (a) Tilt burning candle held over slate. (b) Note wax on slate.	Wax drops on slate. Wax becomes hard.	<b>Heat melts wax.</b> <b>Cold makes wax hard.</b>
6. Scrape wax off slate, put in spoon over lamp.	Wax first becomes soft, then melts.	<b>Heat makes wax soft at first, then melts it.</b>
7. Slowly melt lard or butter in a spoon. Ask what happens to butter when put on warm toast.	Lard, butter, become first soft, then melt.	<b>Lard, butter, when heated, act like wax.</b>
8. Make notch in candle about half-inch from top; light. At end of Lesson examine candle and wick.	Candle shorter; wick has wax in it.	<b>The melted wax goes into the wick, and is there burnt away.</b>
9. Hold sheet of white paper flat over candle flame, or smoke glass in candle flame. Refer to soot in chimney, blackening of ceilings, etc.	Paper, glass, become covered with soot.	<b>Candle produces soot, so do fire, lamp, etc.</b>



Candle.

## B.B. SKETCH.

Candle gives { light,  
heat,  
soot.      **Heat melts wax.**  
   **Cold hardens wax.**

Oral composition should follow the Lesson.

NOTE.—A second lesson should be given on the manufacture of a candle.

## VEGETATION AND CULTIVATION. A FIRST LESSON FOR STANDARD II.

*Things required*—Two shallow boxes or trays, the one filled with dry mould and the other with clayey soil; knife, chisel; a young plant with rootlets; some small weeds; small stones or seeds; some powdered chalk.

*Outdoor Work*—The class should be taken to see the different processes of cultivation practised in the neighbourhood, and these observations should extend to both field and garden work.

*Classroom Work*—The Classroom Work should embrace a recapitulation of the observations made during the Outdoor Work *plus* the following simple Experiments:—

Observations and Experiments.	Inferences.
<p><b>PLOUGHING.</b></p> <p>1. Take a shallow box or tray filled with clay, and another filled with dry mould. "Plough" up the mould with a knife. Then plough up the clay, and contrast the thick lumps of clay with the finely divided and dry mould. Then show the rootlets of some young plants, and ask into which soil the tender rootlets would force their way with the greater ease; which soil also would get the greater amount of air.</p> <p>2. Place some small weeds (bits of tender plants will do) in a mass of stiff soil. Then plough one part thoroughly with a knife, and "dig" another part with the chisel. The weeds are uprooted and cut up.</p> <p>3. Take a mass of stiff soil, and bury some small objects (stones, beads, seeds, etc.) in it. Suppose these to represent the larvæ, grubs, etc. of insects. In the stiff condition of the soil the grubs are safe, and can feed on and destroy the roots of the crops. Now "dig" or "plough" up as before. The grubs are turned up, exposed, and destroyed, either by birds (rooks, daws, etc.), who eat them, or by the frost, which kills them.</p> <p>4. Show a piece of iron. Rub it with the fingers; nothing comes off. Treat similarly a piece of rusty iron; something (the rust) can be rubbed off. What made the iron change?</p>	
	<p>The roots would grow farther and easier into dry soil, and so would get more food from it. The dry soil also gets more air, and is therefore more fertile.</p> <p>Ploughing helps to destroy weeds.</p> <p>Ploughing frees the land from grubs, which eat the roots and so damage the crops.</p> <p>Cultivation by turning up the soil, and by exposing it to the air, causes it to be powdered like the rusty iron.</p>

**DIGGING.**

<p>1. Take a mass of compact mould, and "dig" it with a chisel, imitating spade-work. Note the process; each spadeful is broken up and mixed with other earth. Then press the mould firmly together again, and imitate the action of ploughing; the soil is turned up, but is neither so much broken up nor mixed with other earth.</p> <p>2. Press the mould into a compact mass again, and place little heaps of powdered chalk upon it to represent manure. Now show that with the spade (chisel) the manure can be evenly distributed over the ground. Then take another mass of compact mould (or the same mass worked up again), place chalk as before, and imitate the action of ploughing; the manure is not so evenly distributed as with the spade.</p>	
	<p>Spade-work is better than ploughing and gives better cultivation.</p> <p>Spade-work is better than ploughing for manuring the land.</p>

Composition to follow.

NOTE.—A second lesson should be given on Draining, Harrowing and Rolling.

## EXAMINATION QUESTIONS.

- 1.—Make a list of twenty lessons on familiar animals, and explain the order in which you have arranged them.
- 2.—Name the qualities you would select in giving an object lesson to infants on "steel," and state the experiments or illustrations by which you would elicit the ideas, before giving the names of the qualities.
- 3.—Detail the apparatus required for lessons on a coal mine and on the seasons, and draw the diagrams required for the latter.
- 4.—Point out some of the uses of object lessons in infant schools, and illustrate your answers by short notes of a lesson on the "whale" or on "iron".
- 5.—Write out brief notes of a lesson on "glass," and explain your purpose in teaching the names of its qualities.
- 6.—Make out a list of lessons on "common things," illustrative of the pressure of the atmosphere, and give brief heads of one of such lessons.
- 7.—What is the advantage to young children of having lessons on such subjects as a spider, wool, sugar? Enumerate the qualities or peculiarities in each case to which you would specially direct their attention.
- 8.—In giving an object lesson, what is the aim of the teacher in using terms denoting the qualities of the object? What is meant by vulgar and pedantic language?
- 9.—What sort of lessons do you understand to be intended by "phenomena of nature and of common life"? Make a list of twelve such lessons adapted for children in the First Standard.
- 10.—What sort of a sketch should appear on the B.B. at the end of a collective lesson on *one* of these subjects. (*a*) Iron; (*b*) Corn; (*c*) The Ocean; and what is the best use to make of such a sketch when it is written?
- 11.—Show what is the proper use of the B.B. as an aid to recapitulation. Give a specimen of the sketch which should appear on the board at the end of an object lesson.
- 12.—Sketch out a course of lessons on common objects, or on the phenomena of daily life, suitable for children in Standards I., II., and III.
- 13.—What is an object lesson? Show that mere sight is not necessarily knowledge.

*This Chapter is continued in the Appendix.*

## CHAPTER VII.

## KINDERGARTEN.

**I. What it is.**—Kindergarten is the name of a kind of school or training place for young children. The kind of training given is an educative system of play. There is little direct instruction in it, but the children are amused, interested, and taught to observe, think, and manipulate through the medium of toys (gifts) and play (occupations). It strives to develop every faculty a child possesses; to develop power, rather than to store knowledge; to enable the child to educate itself, and to generate the desire to do this.

**II. Its Advantages.**—It possesses advantages belonging to each branch of education—intellectual, physical, and moral.

**1. Intellectual Advantages.**—It aims to utilise a child's natural promptings, to produce accuracy as a habit, to cultivate observation, to teach the child to think, to make it skilful, and to produce pleasure through a right use of its budding intellectual powers.

**2. Physical Advantages.**—The rhythmical movements, the dancing, the singing, and the games, are all physically beneficial. The child's natural love of activity, curiosity, and play is noted and utilised. The health is improved, and consequently the mind is strengthened. The limbs are exercised and developed, whilst the eye and the ear are brought into disciplined use.

**3. Moral Advantages.**—Lessons of care, neatness, accuracy, order, love of work, kindness, truthfulness, obedience, and the beautiful, both in nature and in human conduct, are all inculcated. Furthermore, it is the proper nursery of that improved objective teaching which is now so materially leavening our educational system by increased Object Lessons, by Drawing, by various forms of Manual Instruction, and by Technical Education.

**FROEBEL'S GIFTS. I. Play.**—These were a species of *plaything* out of which the children constructed various objects by way of

instructive amusement. The *games* were accompanied by songs and dancing, both of which are valuable adjuncts to the system. The gifts were really sedentary games enlightened by dance and song, and his motto was: "Let us live for our children".

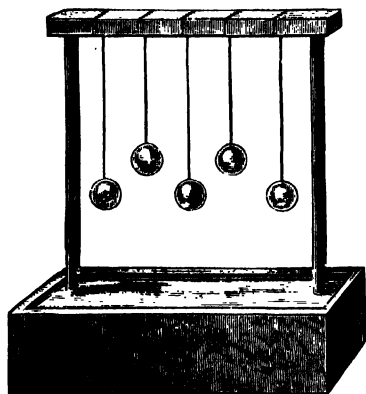
**II. Song.**—These were peculiarly suited to child life. They dealt with incidents of child life, or incidents of the material world around them which came within the comprehension of child life. Some little story was embodied of the pet animal kingdom, or kindred things, and mimicry or work of some kind generally accompanied the song.

**III. Dance.**—These movements were a great improvement upon the ordinary stiff semi-military movements of school drill. Various actions were performed as in musical drill. A great variety of attitudes were required, and so the body was made lithe and strong. The æsthetic and disciplinary effects of the movements were also very important, as the children got good ideas of regularity and harmony.

**IV. Gifts.**—There are seven of these due to Froebel, but the system has been largely expanded and developed by others.

#### 1. First Gift. The Ball.

(a) **Materials.**—It consists of a number of balls (worsted) all of the same size and of different colours. To each ball a string is attached, by which the ball may be suspended. The colours are usually half primary and half secondary.



#### (b) Aim.

1. To train the eye in colours.
2. To exercise the limbs in various ways.
3. To teach directions right and left.
4. To teach properties generally (hard, soft, etc.).

The ball or sphere is chosen for the first gift on account of its simplicity of form. There are no angles and no differing dimensions. The impression made by a sphere is a *single one* and the view is always the same.

(c) **The Game.**—*Various movements* are made with the ball. It is raised and lowered; moved to the right and then to the left; passed from one hand

to the other; from one child to the other. The *rate* of movement also varies, being sometimes quick and sometimes slow, according to the word of command. These orders must be smartly, neatly, and simultaneously executed.

**(d) Its Advantages.**

1. The four mentioned under the head of **Aim**.
2. **Fellowship**.—The children act together, and so develop a sense of fellowship.
3. **Pleasurable Association**.—The teacher is gentle, and enforces gentleness from the children. This sets up an association between play and work, between teacher and class, which is pleasurable.
4. **Selfishness Repressed**.—The class has to act together. No child does what it likes, although it may like what it does. The training of the game is for *all*, not for one. Class sympathy is invoked, emulation is stimulated, but there is no competition for prizes.
5. **Temper**.—Children like working together. The solitary task is rarely liked by a young child, and impotent effort is both discouraging and souring. Class action avoids this.

**2. Second Gift.**

(a) **Materials**.—This gift consists of the sphere, the cylinder, and the cube.

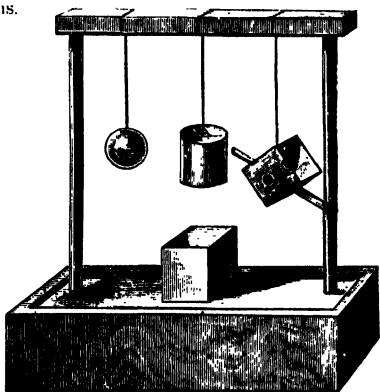
(b) **Aim**.

1. To teach form.
2. To aid the child's natural power of observation, and to help him to discover for himself the similarity and dissimilarity existing between different objects.
3. To give the use of right terms.

(c) **The Game**.—The sides, corners, edges, etc., of the cube are pointed out, explained, and counted. The sphere, cylinder, and cube are contrasted in shape, and so a difference in their properties is deduced. The children are asked to note that the cube and the cylinder vary according to the point from which they are viewed. As each property is distinguished, the proper terms are given and fixed in the minds of the children.

**(d) Advantages.**

1. The "gift" passes from the simple perception of the sphere to the perception and recognition of differences; e.g., sides, lines, surfaces, circumferences, etc.
2. It gives a large amount of actual instruction in the accepted meaning of the word.
3. The facts and relations on which geometrical truths are founded are now made familiar.
4. A good mental training is given.
  - (1) The habit of accurate observation is encouraged.
  - (2) Reasoning from one fact to another is demanded.
  - (3) The perception of necessary relations is taught.

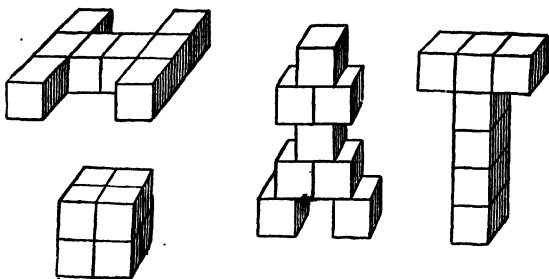
**3. Third Gift.**

(a) **Material**.—A cube consisting of eight smaller cubes, and generally called the *First Building Box*. For the use of the children there is a wooden box containing the eight smaller cubes, each of one inch side. Those for the use of the teacher should be larger.

**(b) Aim.**

1. To teach number; to give the idea of whole and part.
2. To develop constructive power.
3. To teach lessons of symmetry.

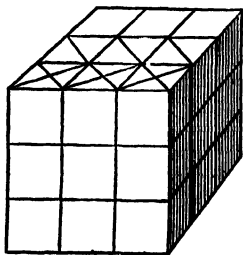
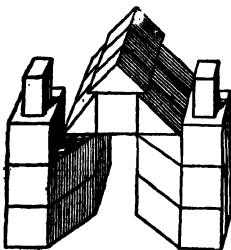
**(c) The Game.**—The child manipulates the small cubes in various ways,



adding them, and taking them away, and so discovers the practical truths of the elementary rules. The things are then named, and some short formulæ may be given. The child is encouraged to put its observations into words. A series of lessons can be given, and various objects may be constructed, such as a table, bench, door, window, steps, castle, clock, chair, etc. The lesson is aided by any anecdote, or any facts of natural history which the objects may suggest. Then after each *set* lesson, the children should be allowed to build according to their own fancy.

**(d) Advantages.**

1. **Utility.**—Objects of everyday use are manufactured, and so the children become familiar with their structure and uses.
2. **Beauty.**—The bricks are all symmetrically laid, and the completion of each object gives a sense of order and regularity.



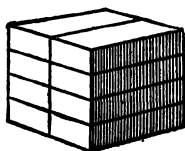
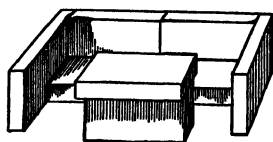
3. **Mental.**—Fresh observations, the perception of similarities and differences, analogies and contrasts, are made.
4. **Interest.**—The arousing of the child's interest is very obvious. Heart and soul is put into the work, and a pleasant and valuable association is set up between work and school.
5. **Originality.**—This is called forth and stimulated. The child is allowed to act independently, and this gives scope for original constructive efforts. The delight and value of such work are considerable.

#### 4. Fourth Gift.

(a) **Material.**—A cube which is divided into eight oblong bricks. It is called the *Second Building Box*. Length = twice the breadth. Breadth = twice the thickness.

(b) **Aim.**

1. To advance upon former lessons, and to give more exercises in building and pattern forming.
2. To give the child the power of selecting the right side.



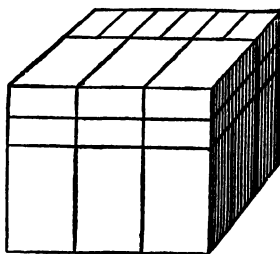
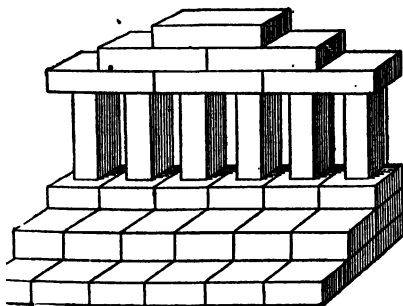
(c) **Game.**—This is much like the last. The child is still amused with its instructive and constructive play. The children first build from the teacher's dictation, and then from their own ideas.

(d) **Advantages.**—It begins a new series of observations of lines and pictures. The third and fourth gifts may be very usefully combined, and a number of advanced and constructive figures can be built. It is recommended that this combination be made before passing over to gift five.

#### 5. Fifth Gift.

(a) **Material.**—*Third Building Box*. It consists of a large cube divided into twenty-one whole, six half, and twelve quarter cubes.

(b) **Aim.**—This gift is really an extension of the third gift. Its aim is to add the study of oblique lines, obtuse and acute angles, to the former lessons.



(c) **Game.**—The same process of training is followed as before. New combinations and fresh objects are formed.

(d) **Advantages.**—Owing to the more complex nature of the gift, all the advantages of the third gift are enhanced.

#### 6. Sixth Gift.

(a) **Material.**—This is the *Fourth Building Box*. There is a large cube, which is divided into eighteen whole and nine small oblong bricks.



(b) **Aim.**—To develop more building exercises and symmetrical forms.

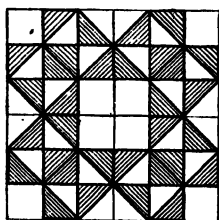
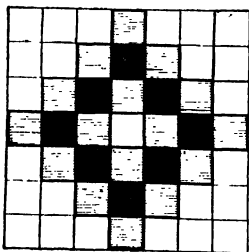
(c) **Game.**—It is really an extension of the fourth game.

(d) **Advantages.**—The advantages of the fourth gift will be increased and extended, since the combinations practised are more complex and advanced.

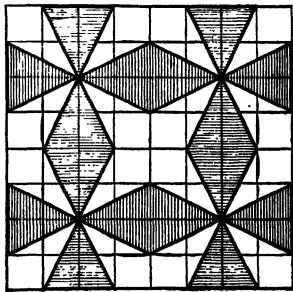
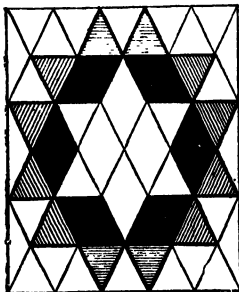
### 7. Seventh Gift.

(a) **Material.**—This consists of planes of polished wood in two colours. There are five boxes, each of which contains a certain quantity of surface objects, *e.g.* :—

- |   |          |                                      |
|---|----------|--------------------------------------|
| A | contains | 64 squares.                          |
| B | „        | 64 right-angled isosceles triangles. |
| C | „        | 54 equilateral triangles.            |
| D | „        | 64 right-angled scalene triangles.   |
| E | „        | 64 obtuse-angled triangles.          |



(b) **Aim.**—Bretsch says the seventh gift has immense capabilities. What they are will appear in the details that follow. Unfortunately, “much of its force and value has been lost for want of systematic form and sequence in the tablets”. It is designed to extend the child's knowledge of form and colour by introducing new combinations



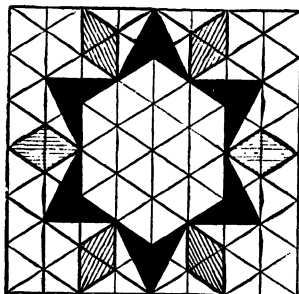
(c) **Game.**—Here there is a series of well-graded games.

1. **The Square Tablet.**—This is a type of four-sided figures. It is given first because it is the simplest of all four-sided figures. The square is the type of all quadrilateral figures.

2. **Equilateral Tablet.**—This is presented next because it is to triangles what the square is to quadrilaterals.

3. **Isosceles Tablet.**—Take a “square” and divide it from corner to corner. We get an isosceles triangle

4. **Scalene Tablet.**—Draw a line bisecting one angle of the equilateral triangle, fold the triangle on this line, and we get the scalene triangle.
5. **Obtuse Tablet.**—Place two scalene triangles base to base, and we get the obtuse tablet or triangle. Thus in the seventh gift there are five forms, and these are capable of unlimited combinations.
- (d) **Application.**—Their application is chiefly artistic and mathematical.
1. **The Square.**—This educates the eye to judge correctly of two very important angles,  $90^\circ$  and  $45^\circ$ , and both of which are of immense importance to the artisan, draughtsman, and to designers. This can be seen from the fact that it gives us the T-square, and it forms part of each of the "set" squares.



2. **Equilateral Triangle.**—This has three angles of  $60^\circ$ , and six of them just fill a circle.
3. **Scalene Triangle.**—This has angles of  $90^\circ$ ,  $60^\circ$ , and  $30^\circ$ . The children must be made subsequently to understand that these are not the angles for *all* scalene triangles. These angles give us another of our "set" squares, and the triangle is very useful in drawing the *hexagon*, as the  $45^\circ$  is useful in drawing the *octagon*.  
A child then knows all the chief angles of design and manufacture— $90^\circ$ ,  $45^\circ$ ,  $60^\circ$ , and  $30^\circ$ .

The above constitute the seven gifts of Froebel's system; but the gifts have been largely expanded of late years, so that now we have stick laying, stick plaiting or interlacing, wood and cork work, rings, drawing, perforating, embroidery, sewing, paper cutting, paper folding, cardboard work, modelling, and others. Each of these is intrinsically very interesting, and each has its special educational value.

**VARIED OCCUPATIONS.**—A little misapprehension sometimes exists in the minds of young teachers as to what are varied occupations. The following is an official list:—

Ages Three to Five.	Ages Five to Seven.
<ol style="list-style-type: none"> <li>1. Games with music.</li> <li>2. Games without music (guessing games, etc.).</li> <li>3. Recitations (nursery rhymes).</li> <li>4. Picture lessons (learning to answer in complete sentences as to what they can see in a picture).</li> <li>5. Paper folding.</li> <li>6. Mosaic with coloured tablets.</li> <li>7. Drawing.</li> <li>8. Matching colours (picking out the same shades of wool from a heap of remnants).</li> <li>9. Plaiting paper.</li> <li>10. Working patterns with needle and worsted.</li> <li>11. Threading beads in twos, threes, etc.</li> <li>12. Arranging shells in twos, threes, etc.</li> <li>13. Arranging "pictures of number" with cubes.</li> <li>14. Word building.</li> </ol>	<ol style="list-style-type: none"> <li>1. Games with music.</li> <li>2. Games without music.               <ol style="list-style-type: none"> <li>(a) Guessing Games, etc.</li> <li>(b) Taking messages.</li> </ol> </li> <li>3. Picture lessons.</li> <li>4. Object lessons.</li> <li>5. Story lessons.               <ol style="list-style-type: none"> <li>(a) Stories from history.</li> <li>(b) Grimm's <i>Household Tales</i>.</li> </ol> </li> <li>6. Recitations.</li> <li>7. Paper folding.</li> <li>8. Mosaic with coloured paper; use of gum.</li> <li>9. Drawing; brush drawing.</li> <li>10. Plaiting paper.</li> <li>11. Ruling simple geometrical forms.</li> <li>12. Measuring and estimating length.</li> <li>13. Weighing; estimating weight.</li> <li>14. Setting a table.               <ol style="list-style-type: none"> <li>(a) Carrying a glass of water without spilling it.</li> <li>(b) Moving cups without breaking them.</li> </ol> </li> <li>15. Modelling in clay.</li> <li>16. Basket work.</li> <li>17. Cutting out patterns and shapes with scissors.</li> <li>18. Word building.</li> <li>19. Number pictures, with cubes, beads, etc.</li> </ol>

**COLOUR.**—All knowledge commences through the senses by sense impressions; hence these lessons should begin at the threshold of school life. Colour should be *taught before form*, because—

1. It is more attractive to children.
2. It is a refreshing change from other work.
3. It is more simple than form. The recognition of colour is a simple sensation, whilst the recognition of form involves more than a simple sensation.

**I. Stages.**—There should be three stages.

**1. To Distinguish Colours.**—This should be confined to the three primary colours, red, blue, yellow, and should be the work of the babies.

**2. To Match and Distinguish two shades of the same colour.**—The shades selected should be widely apart.

**3. To Harmonise Colours.**—To fill in two or three shades between two extremes.

**II. How Taught.**—These lessons can be given in various ways:—

**1. By Contrast and Harmony.**—The colours can be put one against the other in such a way as to illustrate both these principles.

**2. By Reference.**—Flowers, articles of clothing, etc., can be referred to. Worsted balls, ribbons, beads, marbles, hair, eyes, chalks, etc., also,

**3. By Kindergarten Gifts.**—Several of the gifts lend themselves to this purpose, whilst colour sheets, pictures, and ravelling may all be utilised. Tablet laying, perforating, embroidery and sewing, paper cutting and paper folding, weaving, or paper plaiting, etc., all assist.

**III. Apparatus.**—This will depend on the nature and method of teaching employed, but the following are recommended:—

1. A sheet of coloured squares showing—

- (a) Black and white.
- (b) Primary colours.
- (c) Secondary colours.
- (d) Common shades of different colours.

2. Loose cards coloured in the same way.

3. Coloured wools and textile fabrics.

4. Coloured pictures.

5. A set of small drawing models painted in different colours.

**IV. General Principles. Plan of a Lesson on a Secondary Colour.**

**1. Experiment and Observation.**

(a) *Mix* the two primary colours which form it, e.g. :—

Red and blue mixed give purple.  
Red and yellow       "       orange.  
Blue and yellow       "       green.

Do not tell the children what will happen. Let them *observe* carefully, so that they may see the result for themselves. This will ensure *interest and attention*.

(b) Use a *prism*. Decompose light by the aid of a prism, and throw the colours on the wall. Of course, a suitable day is wanted.

**2. Judgment.**

(a) Get the children to *select a shade* between two other shades, to point out a lighter or darker shade than the one pointed out by the teacher.

(b) As a further exercise, they could have a number of colours submitted to them in a convenient way, which they should be asked to *contrast*. The shades in the clothing of their class mates would afford other illustrations.

(c) As the colours are learned, the children should be required to *match* the loose cards from the coloured squares, or *vice versa*.

(d) They should then be asked to *name* familiar objects of colour under observation.

**3. Harmony.**—To teach harmony, accustom the eye of the child to good instances of it. Avoid inharmonious combinations in all lessons, and, if possible, in the colour of the school walls.

**FORM.**—Lessons on form are better instruments for education than lessons on colour; but they are harder, and therefore follow colour. There is much in child school life that can aid the teacher in these lessons, such as kindergarten occupations, slates, pencils, some of the school furniture, the B.B., and books.

**1. Language.**—The teacher must be careful of his phraseology. *Technical terms should be avoided*. The child wants to learn the *objects*, not the names without the objects. For this purpose simple descriptive language should supersede technicalities until a later lesson, since a child may be able to recall an object, but fail to recall its difficult name.

**2. Size.**—Size should be taught first. Children readily perceive the different bulks of different bodies. Most answers will only be approximately right, and

*the difficulty increases with difference of form and equality of bulk.* The objects should be placed before the children, compared with some common standard, and their judgment should be invited and corrected where necessary.

**3. Dimensions.**--This would naturally lead on to the teaching of dimensions. Objects of similar shape are larger or smaller than each other, according as they are longer or shorter, broader or narrower, etc., and so the terms *long and short, broad and narrow, high and low, thick and thin, deep and shallow, are learned.* School objects will furnish plenty of material for this, whilst variety can be obtained by references to outside materials and buildings. In most cases--all where possible--the children should actually measure the objects themselves, for which purpose flat wooden rulers should be supplied to them. The synonymy of height and depth should be illustrated.

**4. Positions.**--Lines may be drawn on the B.B. in one position, in two, and in three--the upright, the lying down or level, and the slanting. These can then be *mixed* and the class tested. The children can be asked to put their books or pencils, etc., in the various positions. They can then draw the lines on their slates to the teacher's *dictation*. Drawing can also be done from *imitation* on the B.B., the teacher gradually building letters like I, H, T, L, E, F, embracing perpendicular and horizontal lines (uprights and levels), whilst X, W, V, M, N, Z, introduce the slanting line.

**5. Curve.**--The *curve* will follow. It is already a familiar shape to the children. Balls, marbles, apples, oranges, coins, crockery, wheels, clocks, watches, etc., are known, and can be utilised as illustrations.

The *capital letters* like C, G, J, O, Q, B, R, D, S, can be introduced, and their elements analysed. The children might then try to copy them. Some teachers recommend the *petals of flowers* for the teaching of form and colour, but there are difficulties which make their use doubtful, at least for form, for young children. The supply of flowers would be one, the varied forms of the petals another, the difficulty for young children of folding out the petals to their true shape another; but, where practicable, the exercise could be made very interesting.

**6. Surface.**--This could now be taught from the observation of flat and spherical bodies.

**Drawing.**--This is one of the most *interesting* and most *instructive* of the many gifts of the kindergarten method. Its connection with *writing* has already been pointed out, but it possesses other advantages over and above this. It is the first step to *design*, and the improvement of design is very necessary for the maintenance of some of our manufactures. It is an essential to many occupations; it encourages and develops *observation*, cultivates the *graphic memory*, exercises the *imagination* in the construction of design, cultivates the *perceptive faculty*, and gives a *delicacy of manipulation* which is very valuable. Furthermore, *description* appears in its most successful form in drawing, for the most gifted writer cannot present a scene like a picture, which always appeals to the understanding and the emotions more rapidly and more successfully than any word description. It develops the *aesthetic emotion* by raising the tastes of the people. Good works of art may and often do become objects of enjoyment where the drawing faculty has been cultivated, whilst *habits of care, neatness, and accuracy* are produced which must react upon the general character.

**Apparatus.**—Graduated *slate cards* should be used in the earliest classes, *squared paper* for the higher classes, and the whole work should be based on Froebel's system. Where Mulhauser's system of writing is taught, the squares are a training for the use of the rhomboids. A *chequered B.B.* will be necessary for demonstration. The work might be divided into three stages.

**1. First Stage.**—Squared slates and paper are recommended for the following reasons:—

(a) To guide the child's hand.

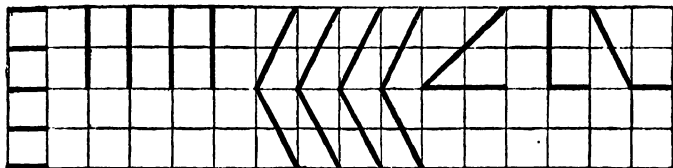
(b) To give the first ideas of length and proportion.

This stage deals only with the length and direction of straight lines and common angles. The exercises should be graded thus:—

(a) Level (horizontal) lines.

(b) Upright (perpendicular) lines.

(c) Slanting (oblique) lines.



*Common simple terms* should be used first, the technical names being given afterwards. Alternate lines are then drawn through two spaces, and the perpendicular and horizontal are brought near to each other for comparison. Oblique lines are similarly treated, and the process is continued until the lines run through five squares. The *common angles* could then be taught. They could be spoken of as small corners (*acute*), large corners (*obtuse*), and (*up*)-right corners.

**2. Second Stage.**—In this stage, the lines are grouped to form figures in various positions. The figures are *geometrical*, like the *right-angled triangle*, the *square*, and *combinations of these*; e.g., two right-angled triangles may give a square; a series of squares of graded sizes joined together give *steps*; and so on. The children thus get their first idea of design by learning the analysis and synthesis of common geometrical figures. This method of teaching offers large scope for figure building, and is very interesting to children.

**3. Third Stage.**—Further combinations are made in this stage. Larger and more complicated figures are given, and simple, pretty, straight-lined designs are sometimes the result. The children might also be left to their own ingenuity now and then to devise designs of their own. The system also lends itself readily to *dictated and memory drawing*.

### EXAMINATION QUESTIONS.

1.—Give the heads of a lesson on the three principal colours, and say what objects, pictures, or apparatus you would need to make such a lesson interesting and useful.

2.—Describe the best system you know for teaching form and colour.

3.—Explain the terms kindergarten, Froebel's gifts, and state fully the educational value of the second and fourth gifts.

4.—Detail some of the geometrical properties that may be taught to young children by folding square or rectangular pieces of paper, and give illustrative diagrams.

5.—Give examples of kindergarten exercises that may be used to stimulate invention and imitation in young children.

6.—Enumerate Froebel's seven gifts, and show the progressive nature of their lessons.

7.—For what purposes are lessons on form and colour given to infants? Name the order in which the principal plane figures should be taught.

8.—Describe the earliest lessons in drawing which would be given in an infant school.

9.—Of all the different employments now used in infant schools, besides the learning of reading, writing, and arithmetic, which do you consider most useful and interesting, and why?

10.—The Code requires that "appropriate occupations shall be provided for children in an infant school, besides instructions in reading, writing, and arithmetic, and in common objects". What are the best of these "occupations," and what educative purpose do they serve?

11.—In what order would you use the kindergarten "gifts" in an infant school? How should the lessons be conducted so as best to exercise the intelligence and observation of the children?

12.—*Notes of Lessons.* The square and its properties (I.).

13.—"It should be borne in mind that it is of little service to adopt the 'gifts' and mechanical occupations of the kindergarten, unless they are so used as to furnish real training in accuracy of hand and eye, in intelligence and in obedience." Explain and illustrate this passage, and show how a teacher can best give effect to its recommendation.

14.—Describe a good lesson on colour adapted for an infant class, and say what illustrations you would get together before giving such a lesson.

15.—Say how you could, either by paper folding or by simple drawing, make the properties of a square visible to young children, and explain what are the uses of such a lesson.

16.—Taking a square of paper, what simple ideas of form can you impress on a class by folding a paper so as to make a single crease in it?

*This Chapter is continued in the Appendix.*

## CHAPTER VIII.

### ARITHMETIC.

IN the Revised Instructions issued to Her Majesty's Inspectors, it is stated that many experienced teachers believe that the true progression in Arithmetic is not to be found in advancing from addition and subtraction to multiplication and division, with the large numbers often given in sums; but in graduated exercises beginning with small numbers and exhausting all their combinations. Such teachers will take, for example, the number twenty, and, after helping the scholars to count cubes or other objects, will dissect the number, find out in how many ways it is made up, learn its fractions and aliquot parts, apply it to money, length, hours, and minutes, and perform all the arithmetical processes, both orally and in writing, which can be dealt with within that limit, higher numbers and more elaborate exercises in notation being reserved to a later stage. Whether this course be followed or not, the reasons of arithmetical processes should be properly explained and understood, for this is a department of school work which has been much overlooked. There is in an elementary school course scarcely any more effective discipline in thinking than is to be obtained from an investigation of the principles which underlie the rules of Arithmetic. When children obtain answers to sums and problems by mere mechanical routine, without knowing why they use the rule, or when, on receiving a question or a problem, they ask, "What rule is it in?" they cannot be said to have been well instructed in Arithmetic.

It must be remembered that Arithmetic is both an art and a science, the former being all-important for practice and the latter for training. The science deals with the properties and principles of numbers, discovers their truths, and hands them over to the art which applies them. Each has its value; but when Arithmetic is all art, as it often has been in some schools, it then becomes a mere imitative or mechanical process, and quite useless as a



means of training—its highest value. It will thus be obvious that for the efficient handling of the subject it must, like Grammar, be taught inductively and applied deductively. Every new rule or truth should be taught by this inductive method; nor should the rule be applied to the working of examples until the reasoning underlying those truths is perfectly clear to the class.

Good teaching will seek to reduce the labour involved in the work to a minimum; to supply easy and short rules, clear and intelligent methods, sufficient and suitable explanations, backed by well-chosen examples. The newer and abbreviated methods will enable the teacher to get rid of cumbrous operations, which breed fatigue and disgust for the subject. Assistance will be so given as to encourage self-effort; the methods of teaching adopted will strengthen concentration, which is all-essential in Arithmetic; and it will insist upon the work being set out in a neat, legible, and clear style, whilst numerous suitable exercises will ensure rapid and accurate computations and solutions.

### **ADVANTAGES OF TEACHING ARITHMETIC.**

**1. Reasoning.**—It is a fine aid towards building up the reasoning powers, being both inductive and deductive in its teaching. A small number of fundamental propositions is laid down consisting of such definitions as "Two is one and one," "Three is one and two"; or such axioms as "The sums of equals are equal," or "The differences of equals are equal," and from these propositions are derived a large number of truths and applications of truths. Arithmetic makes the mind precise and accurate in its statements and judgments, and gives an orderly turn to it. By its aid the pupil learns to distinguish between the essential and the non-essential, and, generally, it supplies him with some necessary materials and training for scientific reasoning; and, finally, as it deals largely with abstract numbers, it assists considerably in developing the power of abstraction.

**2. Truth.**—It is an enemy to fallacies. Under its influence the pupil learns to accept nothing without a clear reason capable of demonstration. Some urge, however, that a too exclusive devotion to the wider subject of mathematics gives a wrong bias of mind respecting truth generally; and although what is true of mathematics is largely true of arithmetic, nevertheless there is no fear of falling into this misfortune in an elementary school. We learn from Mill the reasons why the primary truths of mathe-

natics seem to have a greater certainty than other inductive truths:—

- (a) **Their Universality.**—They are true of everything, everywhere, and at every time.
- (b) **Their Extreme Familiarity.**—The perception of their truth only requires the simple act of looking at objects in the proper position, and often only thinking of them in such a position. Hence exemplifications of their truth are incessantly presented to us.
- (c) **The Absence of any Analogies to Suggest a Different Law.**—This is very important. If everything in the universe always maintained a condition of absolute rest, we might find as much difficulty in conceiving the possibility of the sun falling from the sky as we now have of conceiving that two straight lines can enclose a space.
- (d) **They are Never Counteracted,** being independent of causes.

**3. Attention.**—It is a fine aid to concentration, depending for its success upon the undivided attention of the pupil.

**4. Emotional Effects.**—It is generally *popular* with children, especially with those who can master its difficulties readily. There is a consciousness of *power* following success, an intensified *interest of pursuit*, a rebound of *intellectual pleasure* over some problem solved. Its many devices for solution arouse *wonder*, and the capacity to deal with its problems gives a healthy *self-esteem*.

**5. Its Practical Uses.**—These are so obvious as to scarcely need mention. Apart from the training and discipline supplied on the inductive side, it forms a necessary qualification for everyday life, and especially for the shopkeeper, the merchant, the clerk, the engineer, surveyor, astronomer, accountant, and many other callings.

**NOTATION.**—The teaching of notation to very young children requires much care and skill, for it involves the difficult transition from the concrete to the abstract. Such concrete objects as kindergarten sticks, cubes, the ball frame, lines or dots upon the B.B., picture numbers or money, are now invariably used, so that this branch of school work is taught on more scientific methods than formerly. Constant reference is made to the apparatus, and, where possible, the children are allowed to manipulate the objects themselves; and although the very large classes in many of our modern schools make this manipulation a serious consideration both as to time, expense, and discipline, still it is based upon a principle of child life, and should be adopted even in the face of difficulties. The arithmetic then affords training for both hand and eye, and both kindergarten sticks and picture numbers afford opportunities for this kind of teaching. For this reason, where such things are available, and one kind at least

ought to be available in every school containing young children, it is recommended that the lessons be given with their aid.

**The Numbers from 1 to 9.**—Taught with kindergarten sticks. Several lessons will be necessary. The skill of the teacher is the deciding factor rather than any fixed division of lessons.

**First Lessons.**—Have 5 sticks distributed to each child. At a subsequent lesson the whole 9 could be given out.

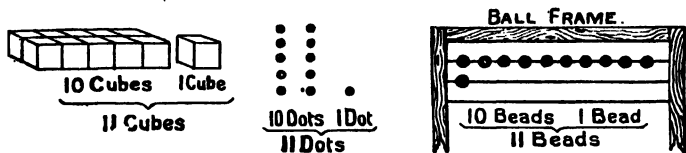
1. (a) The teacher holds up *one* stick, and says *one stick*, the children repeating while lifting up one stick each. *The number name is thus associated with the object.*
- (b) Now show one cube, one finger, one marble, etc. In each case the children repeat one cube, one finger, or one marble. *The object is to accumulate instances.*
- (c) Now place a dot or a line upon the B.B. The children again say "one dot" or "one line". They should be asked to make a dot or a line upon their slates. Then put the figure one (1) on the B.B. Let them make it upon their slates. Tell them that it represents 1 stick, 1 cube, 1 marble, etc. Impress upon them the fact that 1 always means 1 something. The object is to get them to recognise the written symbol for 1.
2. Hold up a *second* stick in the other hand. The children recognise it as *one stick*, and say so. They notice that you have one in each hand. They then take up another stick themselves, imitating you. Transfer both sticks to one hand, the children again copying. Now tell them that *one stick* and *one stick* make *two sticks*, the children repeating as before. Now make another dot or line upon the B.B., beside the first one. How many dots now? Repeat with other objects. Then make a figure 2 on the B.B., let the children copy on their slates, and again make them understand that this figure stands for *two something*—sticks, cubes, balls, etc. Then exercise the class in picking out two things about the room.
3. Proceed in the same way with the other numbers, remembering that as the numbers increase in value fewer should be taken for one lesson, because a greater variety of simple arithmetic exercises may be worked from them.
4. Make use of the sticks to perform simple exercises in the simple rules; e.g., let children take up 3 sticks in one hand and 2 in the other. Then transfer them to one hand. Count them—thus 2 and 3 make 5. Such exercises as  $4 + 1$ ,  $3 + 2$ ,  $2 + 2$ ,  $2 + 1$ , etc., could be worked in the same way; or  $5 - 4$ ,  $4 - 2$ ,  $3 - 1$ . There are 2 twos in 4, 5 ones in 5, 5 ones make 5, and so on.

**Numbers from 10 to 20.**—Still taught by kindergarten sticks, but now each child will require two bound bundles of sticks, each bundle containing ten, and ten separate individual sticks also. This will be a big demand where the classes run to sixty, but it should be met if possible. The bundles should be strongly bound.

**1. To Teach 10.**—The teacher picks up 10 sticks one at a time, the children imitating and naming as the groups increase up to 9. When the *tenth stick* is reached give them the new name *ten*. Let them show their 10 sticks and name them. Vary the instances again, and let the children count and name in each case. Now write the symbol 10 on the B.B., let them write it on their slates, and make them understand that this represents *ten* somethings. Plenty of exercise of the kind specified now should be given.

**2. To Teach 11 and 12, etc.**

- (a) Let the children take up a bundle of sticks each, and count the number of sticks in each bundle—10. Then one bundle is equal to ten single sticks. Take up a bundle in one hand and a single stick in the other. Class imitate. Transfer both to one hand. How many sticks has each one now? 10 and 1. Tell them 10 and 1 make eleven. Let them repeat the name. Its notation presents a fresh difficulty. Make a large figure 1 on the B.B., and tell them that stands for 1 bundle, or 10 sticks in 1 bundle. Then make a small 1 beside it to represent the individual stick, thus, 11. Let them copy the symbol on their slates, and tell them that the figures stand for 11. The name is thus fixed to the symbol. Vary the instances again, showing 11 cubes, or 11 marbles, etc., and let them name the number in each case. A proper arrangement of the cubes, dots, balls, etc., will greatly assist in the formation of a right conception, thus—



- (b) The same method could be adopted for the teaching of 12, and now the teacher will be able to illustrate with a shilling and 12 pennies or with a sixpence and 12 halfpennies. All the numbers up to 19 could be thus treated, the teacher remembering to follow out the various steps in each case as detailed in the lessons given above. For the present the symbols might still be represented with a large figure for the tens, and a small one for the units, thus, 11, 12, 13, 14, 15, and so on. But subsequently the teacher must reduce the tens figure to the same size as the units, and associate its greater value with its position. If coloured chalks are used in the first case to mark the tens figure, the symbols will be still more intelligible to the children. The teaching of 20 ought to present no difficulty to the teacher now

**Numbers above 20.**—The process is practically the same, and there ought to be no further difficulty in dealing with this branch of the subject. As the numbers proceed, the children should be exercised in building up the numbers with the sticks, and afterwards in decomposing them. This will afford capital practice both in *synthesis* and *analysis* of numbers, which is so necessary to the right understanding of some of the after processes in arithmetic. When the children are familiar with the new names for the symbols 30, 40, etc., the connection between them and the numbers between 12 and 20 might be contrasted and explained thus:—

three (3)	and thirteen (13)	and thirty (30).
four (4)	„ fourteen (14)	„ forty (40).
five (5)	„ fifteen (15)	„ fifty (50).

**The Notation of Hundreds.**—The class already knows up to

99.

**1. New Names.**—With kindergarten sticks show that *ten tens make 100*. Give the new name, write its symbols on the B.B., let class copy on their slates and repeat the name. In a similar way, let them learn to recognise when written on the B.B. and on their slates 200, 300, etc., up to 900. There will be no difficulty with this step.

**2. Decomposition.**—Now have the numbers decomposed. The class are already familiar with the process with numbers of two figures, thus:—

100 = 10 tens and no units; or 1 hundred 0 tens 0 units.

200 = 20 tens and no units; or 2 hundreds 0 tens 0 units.

**3. Notation.**—Call attention to the fact that *we simply name what is present* and say nothing of what is absent. We do not say one hundred no tens and no units, but simply one hundred, or two hundred, etc. Rule three parallel columns on the B.B., and head them units (U), tens (T), and hundreds (H), and see that the class understands them.

**4. Further Decomposition.**—Give further practice in decomposition—

70 = 7 tens.

300 = 30 tens or 3 hundreds.

111 = 11 tens and 1 unit; or 1 hundred 1 ten 1 unit.

326 = 32 tens and 6 units; or 3 hundreds 2 tens 6 units.

Now ask in which column 70 should be placed. Its decomposition helps them to recognise it as 7 tens, and so to place the 7 in the tens column; 300 would be 3 placed in the hundreds column; 9 would be placed in the first column, and so on.

**5. The Cypher.**—Now introduce the cypher. Hitherto we have not heeded it in the notation exercises of this stage.

(a) **In the Units.** Take 420 as an example. Have the number analysed into 4 hundreds and 2 tens. *The absence of units is expressed by a cypher or nought (o).* Compare 10 and 20. The 20 they already know how to write, and the position of the hundreds (4) is now easily fixed for them. Give other examples, as 340, 670, 280.

(b) **In the Tens.**—As in 709. Analyse again into 7 hundreds and 9 units. *The absent tens are expressed by a cypher (o).* Then we write 7 in the hundreds column and 9 in the units. In the middle column (tens) there is a cypher (o) to indicate the absence of tens. Give other examples. Diagrammatic aids may be given by varying the size of the figures according to their place values; e.g., 249. The chief value of such a system is that it accustoms children to associate increasing values with figures as they proceed to the left. The notation of thousands can be dealt with in the same way. Perhaps it is hardly necessary to remind students that this method of teaching notation teaches numeration at the same time.

**NUMBER PICTURES.**—The use of number pictures is recommended by the Department in Circular 322 for use in all classes, and a scheme has been elaborated for teaching the numbers up to twenty by means of these number pictures.\* There is no doubt about their value educationally, and they constitute one of the best applications of kindergarten yet made. The work is made very attractive and suitable, and the old mechanical faults common to the teaching of this branch of arithmetic are destroyed by it. Children, rightly taught by these tablets, would soon love arithmetic, and would take their first steps under really scientific principles. There is no better method of teaching this stage of the work than by those sheets and tablets.

**Requirements.**—To make their use effective the author lays down certain requirements.

\**Hand and Eye Arithmetic for Infants*, Blackie & Son.

1. The number pictures should be bright and attractive.
2. The value of each of the numbers 1 to 10 at least (preferably 1 to 20) should be impressed on the memory by a distinct mental picture.
3. The difference in the value of numbers should at once be apparent to the eye.
4. In each picture number the concrete and the abstract should be combined.
5. The number pictures should allow all the component parts of the number to be vividly shown, both in the concrete and in the abstract, as a result.
  - (a) The truth of the equality of each pair of components with the number itself is self-evident to the eye.
  - (b) The picture of each pair of components is so vividly impressed upon the mind, through the eye, that the mention of one component immediately recalls the other.
6. The number picture should represent pictorially our system of notation.
7. The number pictures should be of such a character that they can be reproduced with ease by the children.
8. The number picture should, if possible, illustrate pictorially the processes of the four simple rules.

### Apparatus.

1. **The Vivid Arithmetic Sheets for Number Laying.**—These are for the teacher's use, and are adapted for class teaching. They include four large sheets on rollers, and on them each number from 1 to 20 is represented by a distinct picture in bright attractive colours. It is claimed that the value of each number is impressed on the mind in three ways :—

- (a) By the number of unit squares which compose the concrete representation of the number.
- (b) By the size of the figure itself, each figure being drawn to scale.
- (c) By the space covered.

2. **Vivid Tablets.**—These are supplied to the children, and correspond to the colours on the sheets, which enable them to build an exact representation of each picture number.

3. **Other Apparatus.**—So far as can be gathered from the first few lessons, there would also be required :—

- (a) *Slates* ruled in squares to suit the tablets.
- (b) *Blackboard* ruled to match the slates.
- (c) *Cardboard Figures.* A set of these should be given to each child.
- (d) *Pencils.* Three for each child.
- (e) *Apples.* To teach fractions.

**Teaching.**—Special stress is laid on the following instructions :—

1. The *model* picture should be made thoroughly secure before attempting to teach the components.
2. The components should first be taught as *pictures*, and when these are thoroughly known, this knowledge should be applied to other concrete objects.
3. Hasten slowly. The knowledge of one number must be thorough and accurate before the next is attempted.
4. The children must *perform* with the tablets the operation required to find the answer.
5. An incorrect answer is never to be passed over. The child should always be required to find the correct answer for itself by means of the sheets or tablets, under the guidance of the teacher.
6. The sheets should be kept constantly in front of the class, and every spare moment should be utilised in questions dealing with some number already taught.

**Plan of Lessons.**—To teach the numbers from 1 to 20, twenty-three lessons are required, the seventh and thirteenth being recapitulatory lessons; and the first lesson being on counting objects from one to five to familiarise them with the idea of number, and the names they have to use subsequently. The steps in each lesson from the third onwards comprise certain well-arranged steps which are similar, though not always identical, in all the lessons. Let us take the third lesson, on the number 2, as an illustration. The steps involved are:—

- (a) First teach picture 2.
- (b) Then figure 2.
- (c) Then the components.
  - (1) As pictures.
  - (2) Application of the pictures to other objects.
  - (3) Fractions.
- (d) Exercises without squares. Sheets may be used.

### To Teach the Number 2.

#### 1. Picture 2.



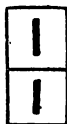
- (a) The children pick out a brown "*picture-one*" and place "*figure-one*" on it.
- (b) Another brown "*picture-one*" is chosen, and placed by imitation end on to the other.
- (c) It is seen to be larger than *picture-one*, and a new name is given. The children, on invitation, count the two squares. It is then called *picture-two*.
- (d) Brown *picture-two* is picked out on the sheets.

#### 2. Figure 2.

- (a) The teacher points to *figure-two* on the sheets, and invites the class to find a figure from the cardboard figures like it.
- (b) *Figure-two* is named and placed on *picture-two*.
- (c) The process is repeated with red and blue tablets.
- (d) Children draw *picture-two* on their slates and make *figure-two* on it, the teacher guiding.

#### 3. The Components 1 + 1.

- (a) *As Pictures.* The model *picture-two* should lie on the desk in front of each child.



1. A red and blue *picture-one* are placed end on end, and the class is invited to name the picture formed—*picture-two*.
2. A question elicits that *picture-one* and *picture-one* make *picture-two*.
3. *Picture-two* is picked out on the sheets.
4. The class is asked how many *picture-ones* make *picture-two*.
5. They are then asked how many times *picture-one* can be taken away from *picture-two*. The answer is given and the operation performed by the children.
6. The children then build with the sheets for other *picture-tuos*.
7. They then build from memory without the sheets.
- (b) *Application of the Pictures to Other Objects.*—The children must point to the *pictures* corresponding to the number of objects spoken of, as soon as they are mentioned. Thus they—

1. Learn that the *pictures* are of general application.
2. Obtain the required result with absolute certainty.
3. Deepen the mental picture of the components of the number each time they are referred to.

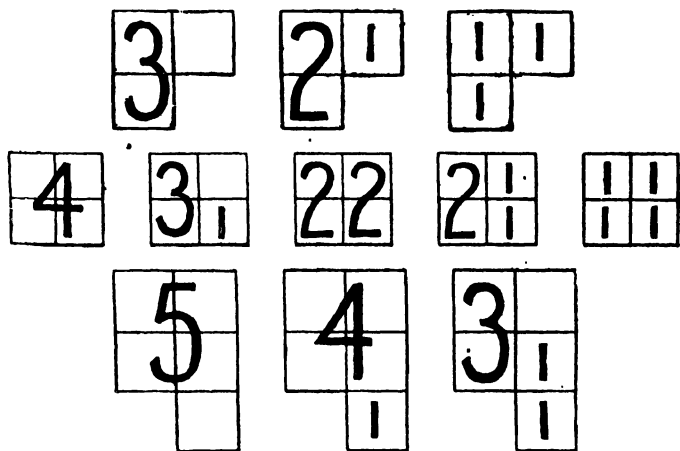
Objects are named and simple operations performed without the tablets, but with the aid of the sheets. They then work from memory again. The exercises should be very simple, and of course limited to 2.

(c) *Fractions. The Half.*

1. An apple is cut in two equal parts. Each part is called a *half*.
2. Brown *picture-two* is made. *Picture-one* is taken away, and the class is invited to say how much is taken away—*one half*.
3. They are then asked what picture forms a half of *picture-two*—*picture-one*.
4. How many *picture-ones* are there in *picture-two*?—two pictures, etc.
5. How many halves make the whole?—two halves, etc. Remember the answers are always to be in complete sentences.

4. **Exercises without Squares.**—Sheets may be used.

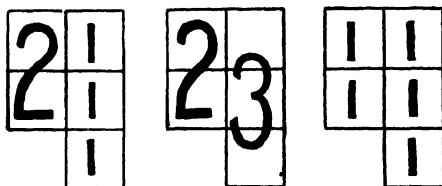
**Subsequent Lessons.**—These are very like the lesson on the number 2. The only other thing to notice is the representation of the number pictures themselves, and the various ways in which they are shown. It must be remembered that different colours represent the different components, and that as each square is used, the children should say aloud what picture it completes. A few illustrations of the various ways the numbers may be represented are now given.



When the twenty-three lessons have been given, the teacher is advised to gather together all the parts of the different *multiplication tables* which have been taught, arrange them in order in



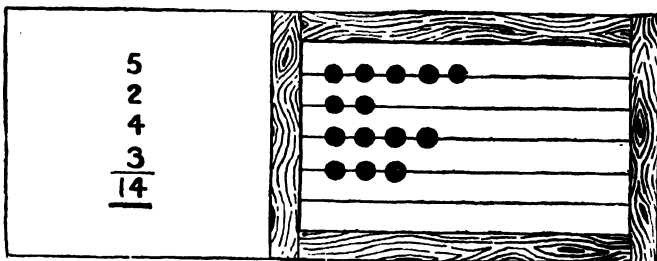
the usual form, and then carefully commit them to memory. The meaning of the tables will have been made so clear during the lessons that it is asserted the children will have little difficulty in learning the remaining parts after constructing them for them-



selves, and applying them intelligently in the solving of little problems. It is also claimed that all the principles involved in dealing with numbers up to 100 have been taught.

### **SIMPLE ADDITION.**

**I. Units.**—To teach simple addition of units, any of the material objects used in the lessons on notation may be utilised. If the teaching in those lessons has been successful, the children ought already to be able to add units up to 100. The teacher's work will then be limited to the method adopted of setting out the work, and to making this intelligible to the children. Where neither picture numbers nor kindergarten sticks nor equivalent aids have been used, the teacher might use the ball frame and the B.B.



1. Dictate the number 5, count 5 beads on the ball frame, and write the figure 5 upon the B.B. Proceed in the same way with the other numbers.
2. In each case the counting is to be done first in the concrete with the beads, then in the abstract with the figures on the B.B.
3. The work is to be done step-wise, thus:—

3 beads and 4 beads make 7 beads.  $\therefore$  3 and 4 make 7.  
 7 beads and 2 beads make 9 beads.  $\therefore$  7 and 2 make 9.  
 9 beads and 5 beads make 14 beads.  $\therefore$  9 and 5 make 14.

4. The teacher then draws a line beneath the 3 and writes down the 14. The class might then go through the same process, beginning with the top figure. The children will see that the same answer is obtained.
5. The work might then be varied with kindergarten cubes, thus:—



3 Cubes

and



4 Cubes

make



7 Cubes



7 Cubes

and



2 Cubes

make



9 Cubes & so on.

The advantage of the cubes is that the *growth* of the addition is made clear step by step. As in the previous case the B.B. should be used. By thus varying the objects, the *certainly* and *accuracy* of the truths involved are impressed upon the child, who thus learns that whatever the object used may be, 4 and 3 always make 7. The transition to the abstract is also rendered easier.

6. All the concrete objects should now be removed, and the work done mentally. Other examples should follow to give the necessary practice for accuracy.

**II. Tens.**—The preparatory lessons on notation, or the use of figure numbers and the arithmetic problems involved, ought still to be sufficient to make this next step fairly easy to the children. "Carrying" is an added difficulty in this case. The numerical box and the B.B. might be used for this lesson.

1. Show the box and explain the use of its compartments. Let the class thoroughly understand that all the units will be placed in the compartments under the U, and all the tens in the compartments labelled T. The hundreds can be left till the next lesson.
2. Practise the class in the decomposition of numbers on the B.B. Thus:—  
 29 is equal to 20 and 9, *i.e.*, to 2 tens and 9 units  
 13 is equal to 10 and 3, *i.e.*, to 1 ten and 3 units.  
 72 is equal to 70 and 2, *i.e.*, to 7 tens and 2 units.

H	T	U
	2	9
	1	3
	7	2
	10	14

to tens make 100. Hence we have 100 and 14, which is written 114.

3. Set the above sum on the B.B., and decompose the first number 29 as shown. The class will readily understand you then when you place 2 sticks under the tens (T), and 9 sticks under the units (U). Proceed with the other numbers in the same way. The bottom compartments can be used as answer compartments.



(b) Now work the process on the B.B.; e.g., take 344 from 721. *Decomposing* each number, we have—

$$\begin{array}{l} 721 = 7 \text{ hundreds and } 2 \text{ tens and } 1 \text{ unit} = 700 + 20 + 1 = 721 \\ \quad = 6 \text{ hundreds and } 12 \text{ tens and } 1 \text{ unit} = 600 + 120 + 1 = 721 \\ \quad = 6 \text{ hundreds and } 11 \text{ tens and } 11 \text{ units} = 600 + 110 + 11 = 721 \\ 344 = 3 \text{ hundreds and } 4 \text{ tens and } 4 \text{ units} = 300 + 40 + 4 = 344 \end{array}$$

$$\text{Difference} = 3 \text{ hundreds and } 7 \text{ tens and } 7 \text{ units} = 300 + 70 + 7 = 377$$

(c) Work other examples on the B.B., supplementing, illustrating, explaining, and correcting where necessary. Let class then work exercises on their slates.

### III. The Method of Equal Additions.

**1. Preparatory Exercises.**—The object of these will be to reveal to the class the fundamental axiom on which this method is based. Use the ball frame or kindergarten sticks, and proceed as follows:—

$$\begin{array}{l} 9 - 4 = 5. \\ (9 + 3) - (4 + 3) = 12 - 7 = 5 \\ (9 + 6) - (4 + 6) = 15 - 10 = 5 \\ (9 + 8) - (4 + 8) = 17 - 12 = 5 \end{array}$$

From these and similar examples the class will infer that if **the same quantity be added to two unequal numbers their difference will remain unaltered.**

**2. Application of this Truth to Other Examples.**—Ask for the difference between 17 and 45—28 by the last method. *But the answer will remain unaltered if I add the same number to both of these quantities, e.g.:*—

$$\begin{array}{l} 45 + 10 = 4 \text{ tens and } 15 \text{ units} = 40 + 15 = 55 \\ 17 + 10 = 2 \text{ tens and } 7 \text{ units} = 20 + 7 = 27 \end{array}$$

$$\text{Difference} = 2 \text{ tens and } 8 \text{ units} = 20 + 8 = 28$$

The children may experience some difficulty in grasping the reason of this, the special point of difficulty being that the additions, although equal, are made to the units in the one case and to the tens in the other. Explain that this is merely a matter of convenience to make the work easier, and illustrate as follows:—

(a) Original numbers 45 } The children are to note that the 7 cannot 17 } be taken from the 5.

(b) Add 10 to each quantity—

$$\begin{array}{l} 45 + 10 = 55 \\ 17 + 10 = 27 \end{array} \text{ } \left. \begin{array}{l} \text{Children still to note that the 7 cannot be taken} \\ \text{from the 5.} \end{array} \right\}$$

(c) Now decompose the numbers. Children to note that the 7 now *can* be taken from 15.

$$55 = 4 \text{ tens and } 15 \text{ units.}$$

$$27 = 2 \text{ tens and } 7 \text{ units.}$$

**3. Exercises.**—Now let exercises be worked on the B.B., and extend the process to 3 figures; e.g., take 354 from 543.

$$\begin{array}{l} 543 = 5 \text{ hundreds } 14 \text{ tens (10 tens added) } 13 \text{ units (10 added)} = 653 \\ 354 = 4 \text{ hundreds (100 added) } 6 \text{ tens (1 ten added) } 4 \text{ units} = 464 \end{array}$$

$$\text{Difference} = 1 \text{ hundred } 8 \text{ tens } 9 \text{ units} = 189$$

The class should now be invited to test the additions. There has been added—

$$\text{To the top line} \quad - \quad - \quad 10 \text{ tens and } 10 \text{ units} = 100 + 10 = 110$$

$$\text{To the bottom line} \quad - \quad - \quad 1 \text{ hundred and } 1 \text{ ten} = 100 + 10 = 110$$

*i.e., Equal Additions are made in each case.*

**IV. The Method of Complementary Addition.**—This method is much the same as what is known as “proving” subtraction. The practice which the children have already received in the analysis and synthesis of numbers will assist materially in making these complementary additions. The method is practically the method of addition by passing over the ten, and it should be pointed out that the difference between a number and a unit of the next higher order of that number is called the complement of that number; e.g., 3 is the complement of 7, because  $10 - 3 = 7$ ; and 28 is the complement of 72, because  $100 - 72 = 28$ . The process of Complementary Additions regards the minuend as the result, and the object is to find a complementary number which, when added to the subtrahend, will equal the minuend. The work may be divided into two well-defined stages.

1. *Cases in which each digit in the minuend is greater than the digit below it.*

987	3	requires the addition of 4 to make 7.
<u>123</u>	2	” ” ” ” 6 ” ” 8.
864	1	” ” ” ” 8 ” ” 9.

2. *Cases in which some digits in the subtrahend are greater than the corresponding digits in the minuend.*

It may be advisable first to work a two-lined addition sum, and then to compare it with a subtraction sum.

Point out that the whole answer 334 is the sum of the two addends 187 and 147, but that each digit in the answer does not represent the sum of the digits above. The

187	334	sum of 7 and 7, for instance, is 14 and not 4.
147	<u>147</u>	Likewise in the subtraction sum, if 334 is the
<u>334</u>	187	sum of 147 and something else, the 4, which
	<u>187</u>	is less than 7, cannot be the sum of 7 and

something else, but only the units digit of the sum, the whole sum being the next number above 7 which ends in 4, i.e., 14. The method of work then may be as follows:—

1. By passing over the 10.

$7 + 3 = 10$ ;  $10 + 4 = 14$ ; put down 4; carry (1).

$4 + (1) = 5$ ;  $5 + 5 = 10$ ;  $10 + 3 = 13$ ; put down 3; carry (1).

$1 + (1) = 2$ ;  $2 + 1 = 3$ ; put down 3.

2. Direct.

$7 + 7$  (put down)  $= 14$ ; put down 4; carry (1).

$4 + (1) = 5$ ;  $5 + 8 = 13$ ; put down 3; carry (1).

$1 + (1) = 2$ ;  $2 + 1 = 3$ ; put down 3.

## TWO METHODS COMPARED.

Decomposition.	Equal Additions.
<ol style="list-style-type: none"> <li>1. It applies and extends the power of decomposing numbers already acquired by children.</li> <li>2. By many the method is alleged to be simpler, and the reason of the process is more readily grasped because no new principle is involved.</li> <li>3. It is not so largely used as the other method.</li> <li>4. By many teachers it is not considered so safe as the method of equal additions.</li> <li>5. Though easier in principle, it is harder in practice, through the mental process of decomposition involved.</li> <li>6. It is the slower method for work probably.</li> <li>7. The occurrence of cyphers increases the difficulty of the work.</li> </ol>	<ol style="list-style-type: none"> <li>1. It introduces and applies one of the fundamental axioms of mathematics—that if the same quantity be added to two numbers their difference remains unaltered.</li> <li>2. It is more difficult of comprehension because the equal additions are made to different denominations. Some teachers hold a conflicting opinion to this.</li> <li>3. It is the general method in practice.</li> <li>4. Many consider it the safer method, because there is no difference in the process, although there may be in the examples.</li> <li>5. Though more difficult of apprehension it is easier in practice. "Borrowing" and "paying-back" is a modification of this method.</li> <li>6. It is the quicker method for work.</li> <li>7. The occurrence of cyphers does not increase its difficulty.</li> </ol>

**THE MULTIPLICATION TABLES.**

**I. Memory.**—The period from the sixth to the tenth years is the best time for memory work, and it is called the **plastic period** of the mind. **Repetition** is necessary for permanence of impression, and the art of teaching the multiplication tables is to lessen the number of repetitions for their retention. The work is exhausting, hence there should be suitable rests and sequences.

The time for memory work is important. **Early morning** is favourable, because the total energy of the pupils is then at its greatest. **The last hour of morning school** is suitable, because the strength of the pupils is then at its best. **Cold weather** is conducive to vigorous mental work, because the vigour of the body is always greater at these periods.

Some natures require prompting or stimulating, hence it may be necessary to subject some pupils to some form of pain, but the association is an unfortunate one, and should be avoided if possible. With the great majority it will always be sufficient to present the work in such a form as will arouse the greatest amount of interest.

The formation of memory depends upon the **formation of good habits** of acquisition, *e.g.*, comparison, contrast, and classification through the detection of similarity and difference. The method of **questioning** adopted by the teacher may also be made to aid memory very much

**II. Teaching.**—The tables may be grouped into two classes : those which are easy, and those which are more difficult of acquisition.

**1. Easy Tables.**—These include the tables for two, three, four, five, ten, and eleven.

(a) **Two Times and Three Times.**—Let the children make up these tables for themselves. Thus  $2 \times 3 = 6$  can be verified by the child, who can count 3 twice or 2 thrice, and so find the total; and so with the other numbers. If the picture numbers have been used, many of the easier products will be already known. The leaps here between product and product are very small, and the mind is generally agile enough to make them. They also enter more largely into the conversation of the children in their everyday life; e.g.: "I'm twice as big as you;" "He has three times as many marbles as John".

(b) **Four Times.** This is easy for the same reasons, though increasing in difficulty over 2 and 3.

(c) **Five Times.**—This is very easy from the alternate recurrence of the 5 and the 0.

(d) **Ten Times.**—This table also is very easy from the invariable recurrence of the 0, and from the similarity of figures in the product and the multiplicand, e.g. :—

$10 \times 8 = 80$	} The attention should be called to all these mnemonics.
$10 \times 5 = 50$	
$10 \times 11 = 110$	

(e) **Eleven Times.**—This is easy until the century is passed, from the reduplication of the figures in the product each time, e.g. :—

11 times 3 are 33.  
 11 " 4 " 44.  
 11 " 5 " 55, etc.

After the century they are harder because this reduplication disappears. The teacher may use devices for fixing, but as there are but three items to learn, a little vigorous repetition would soon fix these. In learning tables a certain amount of rote work is absolutely necessary, and must be faced.

**2. Hard Tables.**—These include the tables for six, seven, eight, nine, and twelve.

(a) **Six Times.**—Seven-twelfths of this table are already known, e.g. :—

$6 \times 1 = 6$	and is the same as	$1 \times 6 = 6$ .
$6 \times 2 = 12$	" " "	$2 \times 6 = 12$ .
$6 \times 3 = 18$	" " "	$3 \times 6 = 18$ .
$6 \times 4 = 24$	" " "	$4 \times 6 = 24$ .
$6 \times 5 = 30$	" " "	$5 \times 6 = 30$ .
$6 \times 10 = 60$	" " "	$10 \times 6 = 60$ .
$6 \times 11 = 66$	" " "	$11 \times 6 = 66$ .

Now divide the remaining products into two classes :—

(1) $6 \times 6 = 36$ .	(2) $6 \times 7 = 42$ .
$6 \times 8 = 48$ .	$6 \times 9 = 54$ .
$6 \times 12 = 72$ .	

In the first class, point to the typed *coincidences*, and give plenty of repetition to both. It may also be advisable to *decompose* the second class, and to show that 6 groups of 7 = 7 groups of 6, and to let the class count the product in each case, thus—

**6 groups of 7.**

**7 groups of 6.**

$$7 \times 7 = 49; 7 \times 8 = 56; 7 \times 9 = 63; 7 \times 12 = 84.$$
$$8 \times 8 = 64; 8 \times 9 = 72; 8 \times 12 = 96.$$

$8 \times 9 = 72$  we again have  $7 + 2 = 9$ .

$9 \times 9 = 81$ , and this can be demonstrated like 49 and 64.

$9 \times 12 = 108$ . Repetition would soon fix this.

$$9 \times 1 = 9$$

$$9 \times 2 = 18$$

$$9 \times 3 = 27$$

$$9 \times 4 = 36$$

$$9 \times 5 = 45$$

$$9 \times 6 = 54$$

$$9 \times 7 = 63$$

$$9 \times 8 = 72$$

$$9 \times 9 = 81$$

$$9 \times 10 = 90$$

$$9 \times 11 = 99$$

$$9 \times 12 = 108$$

**Twelve Times.—**

(2) The ascending order of the tens; e.g., 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

(3) The number of tens in the product is always one less than the multiplier; e.g.,  $9 \times 2 = 18$ ,  $9 \times 3 = 27$ .

(4) The sum of the digits in the product in each case (except  $9 \times 11$ ) is always 9; e.g.,  $18 = 1 + 8 = 9$ ;  $27 = 2 + 7 = 9$ ;  $36 = 3 + 6 = 9$ .

(a) Show that multiplication is only a shortened form of addition, e.g. :—

$$6 \times 4 = 6 + 6 + 6 + 6 = 4 + 4 + 4 + 4 + 4 + 4 = 24.$$



- (b) Take an easy example; e.g.,  $4352 \times 4$ . Decompose the multiplicand, and set out thus:—

$$\begin{array}{r} (1) \quad 4000 \times 4 = 16000 \\ 300 \times 4 = 1200 \\ 50 \times 4 = 200 \\ 2 \times 4 = 8 \end{array}$$

$$\begin{array}{r} (2) \quad 4000 + 300 + 50 + 2 \\ \hline 16000 + 1200 + 200 + 8 \end{array}$$

$$4352 \times 4 = 17408$$

- (c) Then set out the sum on the B.B. in the ordinary form, and explain the "carrying," which the class will now be able to understand. To make the transition easier, and quite intelligible, one extra step might be introduced thus:—

T	II	T	U
4	3	5	2
16 thous.	12 hun. or	20 tens or	8 units.
16 thous.	1 T + 2 II	2 H	8 units.
17 thous.	4 hund.	0 tens	8 units.

Final Form.

$$\begin{array}{r} 4352 \\ 4 \\ \hline 17408 \end{array}$$

### Multiplication by Two Figures.

The class can multiply by one figure, and the same method enables them to multiply by numbers up to 12; hence they can multiply by 10. Take as an example  $4872 \times 67$ .

1. Analyse the multiplier into  $60 + 7$ . We require 60 times 4872 and 7 times 4872, and if we add the two answers together we shall have 67 times 4872.
2. Exercise with multipliers having a cypher in the units; e.g., 20, 30, 40, etc. The class already know how to multiply by 10, and an analysis of the product will show that with all such multipliers we multiply by the tens figure and add a cypher to our answer. The reason is that  $20 = 2 \times 10$ , and so on.
3. Set the work on the B.B. as follows:—

$$4872 \times 7 = 34104$$

$$4872 \times 60 = 292320$$

$$4872 \times 67 = 326424$$

4. Then set the work out in the ordinary form, and show that the bracketed cypher may be omitted without altering the value.

$\begin{array}{r} 4872 \\ 67 \\ \hline 34104 \\ 29232(0) \\ \hline 326424 \end{array}$	<p>Final Form.</p> $\begin{array}{r} 4872 \\ 67 \\ \hline 34104 \\ 29232 \\ \hline 326424 \end{array}$
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### Multiplication by Three Figures.

1. Some preparatory work will be required to explain and accustom the class to two cyphers in the multiplier in such quantities as 200, 300,

400, etc. The class will soon understand why they add two cyphers in the answer. They can already multiply intelligently by such quantities as 20, 30, 40, etc. And decomposition will readily show that  $200 = 20 \times 10$ ;  $300 = 30 \times 10$ ; and in each case both these factors are within the multiplying capacity of the class. Some exercises should be given to test the soundness of their knowledge of this process; e.g.,  $6429 \times 200$ ;  $7835 \times 400$ , etc.

2. Take as an example  $6843 \times 234$ .
3. Decompose the multiplier into  $200 + 30 + 4$ .
4. Proceed as follows:—

$$6843 \times 200 = 1368600$$

$$6843 \times 30 = 205290$$

$$6843 \times 4 = 27372$$

$$6843 \times 234 = 1601262$$

5. Combine the three into the ordinary form, putting the value of each product by its side, and again explaining and demonstrating that the bracketed cyphers may be omitted without altering the value of the answer.

	Final Form.
$\begin{array}{r} 6843 \\ 234 \\ \hline \end{array}$	$\begin{array}{r} 6843 \\ 234 \\ \hline \end{array}$
$\begin{array}{r} 27372 \\ 20529(0) \\ 13686(0)(0) \\ \hline \end{array}$	$\begin{array}{r} 27372 \\ 20529 \\ 13686 \\ \hline \end{array}$
$\begin{array}{r} 1601262 \\ \hline \end{array}$	$\begin{array}{r} 1601262 \\ \hline \end{array}$

**Multiplication by Factors.**—Multiplication by factors is useful as introducing a little variety into the work, and in the case of the products of two factors there may be some economy in time; but there is rarely any advantage practically in dealing with factors beyond this limit. There is the advantage of the extra training in the analysis of numbers, but there is rarely any economy in dealing with such a quantity as 216 by factors, unless the pupil is very ready at such analysis. Whilst he is searching out the factors  $6 \times 4 \times 9$ , he would already have partly made his calculation by the ordinary method. There is no difficulty in demonstrating this method intelligently to the class. The multiplier is factored, and the value of each product is written against it. Take as examples  $3456 \times 28$  and  $7891 \times 216$ .

Factor the multipliers  $7 \times 4 = 28$ ;  $9 \times 4 \times 6 = 216$ .

$\begin{array}{r} 3456 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 7891 \\ 9 \\ \hline \end{array}$
$\begin{array}{r} 24192 = 7 \times 3456 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 71019 = 9 \times 7891 \\ 4 \\ \hline \end{array}$
$96768 = 28 (4 \times 7) \times 3456$	$\begin{array}{r} 284076 = 36 (4 \times 9) \times 7891 \\ 6 \\ \hline \end{array}$
	$1704456 = 216 (6 \times 4 \times 9) \times 7891$

**Short Methods.**

1. With such numbers as 101, 201, 301, etc., it will be noticed that the units are unity and there are no tens.

Take 68754  $\times$  201 as an example.  
 68754 Put down the first two figures (54), and multiply the  
 201 first figure (4) by 2, adding in the third figure back  
 (7), and so on.  
 13819554

This example should be set out on the B.B., and worked by the ordinary method, and the two compared. The reason for the process will then be obvious.

2. With such numbers as 1110 or 1114, it will be noticed that each digit is unity except the first.

Take as examples 56173  $\times$  1110 and 56173  $\times$  1114.

(a) 56173 Put down a cypher for the units in the first ex-  
 1110 ample. In the second multiply by 4, and then  
 62352030 in each case add in at each multiplication as many  
 back figures as there are "ones" in the multiplier;  
*e.g.*, the carried figure is in brackets.

(b) (000)56173 (a) 0; 3; 3 + 7 = 10 (0 and carry 1); 3 + 7 + 1 +  
 1114 (1) = 12 (2 and carry 1); 7 + 1 + 6 + (1) = 15  
 (5 and carry 1); 1 + 6 + 5 + (1) = 13 (3 and carry  
 62576722 1); 6 + 5 + (1) = 12 (2 and carry 1); 5 + (1) = 6.

- (b) The second case is a little more difficult, and it will save errors if the student imagines there to be as many cyphers prefixed to the multiplicand as there are ones in the multiplier.

$(4 \times 3)$	$= (1)2$	$(4 \times 5) + (3) + 6 + 1 + 7 = (3)7$
$(4 \times 7) + (1) + 3$	$= (3)2$	$(4 \times 0) + (3) + 5 + 6 + 1 = (1)5$
$(4 \times 1) + (3) + 7 + 3$	$= (1)7$	$(4 \times 0) + (1) + 0 + 5 + 6 = (1)2$
$(4 \times 6) + (1) + 1 + 7 + 3 = (3)6$		$(4 \times 0) + (1) + 0 + 0 + 5 = 6$

3. With multipliers composed wholly or mostly of nines, *e.g.*, 9, 999, 96, 993, etc. it will be noted that the numbers are always near some multiple of 10. The method is an application of the mathematical truth that if the same quantity be added and subtracted from a number you do not alter its value. Take as examples 3475  $\times$  9; 999; 96. Deal with the multipliers thus:—

9 = 10 - 1; 999 = 1000 - 1; 96 = 100 - 4.

34750 = 10 times 3475      3475000 = 1000 times 3475

3475 = 1 " 3475      3475 = 1 " "

31275 = 9 " 3475      3471525 = 999 " "

347500 = 100 times 3475

13900 = 4 " "

333600 = 96 " "

4. With multipliers composed of multiples of 5.

25. Add two cyphers and divide by 4 for  $\frac{100}{4} = 25$ .

125. " three " " 8 "  $\frac{1000}{8} = 125$ .

625. " four " " 16 "  $\frac{10000}{16} = 625$ .

Obviously such examples as these must be left until division is learned. Some may have to be postponed until fractions and decimals are known, *e.g.*:—

12½.	Add two cyphers and divide by 8 for $\frac{25}{8} = 3\frac{1}{8} = 3\frac{1}{8}$	= 12½
16½.	" " " 6 " $\frac{30}{8} = 3\frac{6}{8} = 3\frac{3}{4}$	= 16½
11½.	" " " 9 " $\frac{11\frac{1}{2}}{8} = 1\frac{9}{16} = 1\frac{9}{16}$	= 11½
9'09.	" " " 11 " $\frac{9'09}{8} = 1'13\frac{3}{8} = 1'13\frac{3}{8}$	= 9'09

**SHORT DIVISION.**—The preparatory exercises introducing Short Division will have been thoroughly mastered during the earlier lessons on addition, notation, etc., with the kindergarten sticks or picture numbers, or other concrete aids. Each term as it is introduced should be explained.

The process is the inverse of multiplication and depends on the recollection of what has been learned in multiplication. The class might examine the following cases:—

- (a)  $\frac{20}{5} = 4$ ,  $\frac{\text{abstract No.}}{\text{abstract No.}} = \text{abstract No.}$
- (b)  $\frac{20 \text{ feet}}{5} = 4 \text{ feet}$ ,  $\frac{\text{concrete No.}}{\text{abstract No.}} = \text{concrete quantity.}$
- (c)  $\frac{20 \text{ feet}}{5 \text{ feet}} = 4$ ,  $\frac{\text{concrete No.}}{\text{concrete No.}} = \text{abstract quantity.}$
- (d)  $\frac{20}{20 \text{ feet}}$  gives no result, or  $\frac{\text{abstract No.}}{\text{concrete No.}}$  gives no result.
- (e)  $\frac{\text{dividend}}{\text{divisor}} = \text{quotient, or divisor and quotient} = \text{dividend.}$

The class might then discover that Division may be defined as the process (1) of finding how many times one quantity is contained in another; or (2) of finding one of the factors (quotient) of a given product (dividend) when the other factor (divisor) is given; or (3) of separating a given number into a certain number of equal parts. Further examination might help the pupils to see that the divisor may be (1) an abstract number, in which case the quotient is the same name as the dividend; e.g., (a) and (b) above; (2) or it may be a concrete quantity of the same kind as the dividend, in which case the quotient is abstract; e.g., (c) above. So that there are really two kinds of division (1) *Quotition*, measuring or arithmetical division, in which we find the number of groups; and (2) *Partition*, sharing, or physical division, in which we find the size of one group.

Its connection with Multiplication and Subtraction might be shown; e.g.,  $5 \times 3 = 15$ ;  $15 \div 3 = 5$ ;  $15 \div 5 = 3$ ;  $15 - 5$  three times = 0, for  $15 - 5 = 10$ ; and  $10 - 5 = 5$ ; and  $5 - 5 = 0$ . In the working of Short Division the office of the various multiplications and divisions are not so apparent, but in Long Division it will be obvious to the children that a series of subtractions is performed and that the quantities subtracted are found by multiplication.

**IV. Short Division with a Remainder.**—Demonstrate with concrete objects.

*Division.*

$$11 \div 2 = 5 + 1$$

$$\text{or } 2)11$$

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$$5 + 1$$

*i.e.*, there are 5 groups of 2 in 11 and 1 unit is left.

*Subtraction.*

$$11 - 2 = 9$$

$$9 - 2 = 7$$

$$7 - 2 = 5$$

$$5 - 2 = 3$$

$$3 - 2 = 1$$

The number of groups of 2 is 5 and the remainder is 1.

Give other examples for practice, still working first in the concrete and then in the abstract, *e.g.* :—

$$19 \div 3 = 6 + 1$$

$$23 \div 4 = 5 + 3$$

$$45 \div 6 = 7 + 3$$

$$14 \div 4 = 3 + 2$$

Call attention to the remainder in each case. *It is always less than the divisor.* The class will now see clearly that the divisor is not always contained an even number of times in the dividend.

By this stage the class should have discovered that a number may be divided up into equal groups exactly, or into equal groups with some quantity less than one of the groups remaining over. *The process of finding these groups is called division.* The quantity contained in one group is called the **divisor**. The number to be divided into groups is called the **dividend**. The number of groups into which it is divided is called the **quotient**. What is left over (if any) is called the **remainder**.

**V. Harder Examples.**—Take as an example  $5729 \div 7$ .

Decompose the dividend 5729 so far as possible into multiples of 7; *i.e.*, into quantities containing an equal number of 7's without a remainder, thus:—

$$5729 = 5600 + 70 + 59 \text{ then}$$

$$7)5600 + 70 + 59$$

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$$800 + 10 + 8 \text{ and } 3 \text{ over.}$$

Which is expressed shortly thus:—

$$7)5729$$

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$$818 + 3$$

The children will now be prepared to receive the *rule* as generally given, and to understand the processes which that rule embodies.

**VI. Division by Factors.**—Take as an example  $349 \div 42$ .

Decompose both divisor and dividend.

$$42 = 6 \times 7; \text{ and } 349 = 300 + 48 + 1$$

$$\text{Then we have } 6)300 + 48 + 1$$

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$$50 + 8 \text{ and } 1 \text{ remainder.}$$

$$\text{i.e., } 6)349$$

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$$58 + 1 \text{ i.e., } 58 \text{ groups of } 6 \text{ and } 1 \text{ unit as remainder.}$$

$$\text{Now decompose } 58 \text{ into } 56 + 2$$

$$\text{Then } 7)56 + 2$$

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$$8 \text{ and } 2 \text{ remainder. i.e., } 7)58$$

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$$8 + 2$$

The whole process is then shown as—

$$42 \left\{ \begin{array}{l} 6 \overline{)349} \\ 7 \overline{)58 + 1} = 58 \text{ groups of } 6 \text{ and } 1 \text{ unit left.} \\ 8 + 2 = 8 \text{ groups of } 42 \text{ and } 2 \text{ sixes left.} \end{array} \right.$$

For total remainder we have—

$$\begin{array}{rcl} 2 \text{ groups of } 6 & = & 12 \\ \text{and } 1 \text{ unit} & = & 1 \end{array}$$

$$\begin{array}{l} \therefore \text{Total remainder} = 13 \\ \text{Which is found thus } 2 \times 6 + 1 \\ \text{Answer } 8 + 13 \text{ over.} \end{array}$$

**Rule.**—Factor the divisor, and divide the dividend by the first factor; then divide its quotient by the next factor. Finally multiply the last remainder and the first divisor, and add in the other remainder (if any), and this will give the correct remainder.

**Divisibility of Numbers.**—A number is divisible by—

1. **Two**, if its units digit is measured by 2. The reason is obvious.
2. **Three**, if the sum of its digits is measured by 3. This will be explained under the divisibility for 9, as 3 is a factor of 9, and a number divisible by 9 is thus divisible by 3.
3. **Four**, if the units and tens divide by 4, for 100 is divisible by 4.
4. **Five**, if the units digit is 5 or 0, for all products of 5 end in 5 or 0.
5. **Six**, if the number is divisible by 2 and 3, for  $2 \times 3 = 6$ .
6. **Seven**, a test of divisibility is known for 7, but it is best done by trial.
7. **Eight**, if the number expressed by its 3 lowest digits is measured by 8, for 1000 is divisible by 8.
8. **Nine**, if the sum of its digits is measured by 9. Take 57978 as an example. Decompose 57978 into  $50000 + 7000 + 900 + 70 + 8$ .

$$\begin{array}{l} \text{Now } 50000 = 9 \times 5555 + 5 \\ \text{and } 7000 = 9 \times 777 + 7 \\ \text{and } 900 = 9 \times 99 + 9 \\ \text{and } 70 = 9 \times 7 + 7 \\ \text{and } 8 = \quad \quad + 8 \end{array}$$

It will be observed that the quantity is made up of factors of 9 + remainders which are the same as the digits in the number.

9. **Ten**, if the number has a cypher in the units. The reason is obvious.
10. **Eleven**, if the difference between the sums of the digits in alternate places is 0, or is measured by 11. For any number as 6743 is composed of—

$$\begin{array}{l} 3 = \quad \quad + 3 \\ 40 = 4 \times \quad \times 11 - 4 \\ 700 = 7 \times 9 \times 11 + 7 \\ 6000 = 6 \times 91 \times 11 - 6 \end{array}$$

It will be observed that the number is composed of factors of 11 + or - remainders which are the same as the digits of the number. It will also be noticed that the signs run alternately

Take another example : 20603.

$$\text{Sum of the odd places} = 3 + 6 + 2 = 11.$$

$$\text{,, ,, even places} = 0 + 0 = 0.$$

Divide each by 11 and you get the same remainder (0). Hence a number is divided by 11 when the sum of the odd figures and the sum of the even figures each divided by 11 leaves the same remainder.

**Short Methods.**—Where practicable, the teacher should teach such short methods as the following:—

1. **To divide by 625.** Multiply by 16 in 1 line and mark off 4 places

$$\text{For } \frac{16}{10000} = \frac{1}{625}.$$

2. **To divide by 625.** Multiply by 16 and mark off 1 place.

$$\text{For } \frac{16}{10} = \frac{1000}{625}.$$

**LONG DIVISION.**—Work an easy example by both methods, and let the class thus discover the reason why the process is called long. They will readily observe that there is less work done mentally by this method, hence its name.

Take as an example  $6863 \div 9$ .

*Short Division.*

$$9)6300 + 540 + 18 + 5$$

$$700 + 60 + 2 \text{ and } 5 \text{ over.}$$

Which is written thus:—

$$\begin{array}{r} 9)6863 \\ \hline 762 + 5 \end{array}$$

*Long Division.*

$$9)6863(700 + 60 + 2$$

$$6300 = 9 \times 700$$

$$\begin{array}{r} 563 \text{ subtracting} \\ 540 = 9 \times 60 \end{array}$$

$$\begin{array}{r} 23 \text{ subtracting} \\ 18 = 9 \times 2 \end{array}$$

$$5 \text{ subtracting}$$

Which is written thus:

$$9)6863(762$$

$$63$$

$$56$$

$$54$$

$$23$$

$$18$$

$$5$$

The class will see that the decomposition is the same in each case, and that *the principle ruling the decomposition is to get numbers which are multiples of the divisor*, and that this is done in each case except the last. The rule could then be given, and other examples worked, gradually increasing in difficulty. The decomposition should be pointed out in each case. It will always be found to be the subtrahend. The work should then be set out in the ordinary way.

If there is any lack of comprehension, the process might be further illustrated as follows:—

$$6863$$

$$\frac{\quad}{\quad} = 700 + 563 \text{ remainder}$$

$$9$$

$$563$$

$$\frac{\quad}{\quad} = 60 + 23 \text{ remainder}$$

$$9$$

$$23$$

$$\frac{\quad}{\quad} = 2 + 5 \text{ remainder}$$

$$9$$

There are two points to notice.

- (1) Each remainder becomes a new dividend until the last is too small; *i.e.*, until the remainder is less than the divisor.
- (2) That the answer is composed of the sum of the quotients + the last remainder.

## COMPOUND RULES.

**Meaning of Term.**—By this phrase we understand calculations made in money and the various weights and measures. In the simple rules we have to deal with quantities formed on one

regular denomination with a fixed relative value, which is regular and dependent on the position of the digits expressing those numbers. Thus in the number 111, *each* figure to the left is ten times the value of the figure to its right. It can be expressed thus:—

$$\begin{aligned} 111 &= 100 + 10 + 1 \\ &= (10 \times 10) + (10 \times 1) + 1 \\ &= (100 \times 1) + (10 \times 1) + 1 \end{aligned}$$

And this is always the case, although it is not always so obvious; *e.g.*, take the number 384, which can be thus decomposed:—

$$\begin{aligned} 384 &= 300 + 80 + 4 \\ &= (3 \times 100) + (8 \times 10) + (4 \times 1) \\ &= (3 \times 10 \times 10) + (8 \times 10 \times 1) + (4 \times 1) \\ &= 10 \text{ times } 10 \text{ times } 3 + 10 \text{ times } 1 \text{ times } 8 + 1 \text{ times } 4. \end{aligned}$$

But this is not the case in the compound rules. We make calculations to *different* bases or denominations; *e.g.*, pounds, shillings, pence, farthings; tons, cwts, etc. The principle is always the same practically; the “carrying” only differs. It will then be noticed that there is a combination of the simple and of something else. *This combination is called compound, and the rules dealing with such combinations compound rules.*

**Explanation of Signs.**—Pounds (£), shillings (s), pence (d), should be explained to the class. They are all derived from Latin words, which were the names of certain coins used by the Romans; and in each case the first letter of the Latin name is used as the symbol. The words might be written on the B.B., but the class need not yet be asked to learn them. It will be sufficient for the present to illustrate their origin. The words are *Libra*, *Solidus*, *Denarius*, *Quadrans* (farthings used to be represented by *Q.*). Treat the other symbols similarly, *as they are wanted* (cwts., qrs., lbs., etc.). The tables and their symbols should be gradually introduced, only the most common given, and examples should be based upon them. It will be necessary to point out that farthings are now expressed as parts of a penny, thus:—

$$\begin{aligned} \frac{1}{4} &= \text{one-fourth of a penny} &= 1 \text{ farthing.} \\ \frac{1}{2} &= \text{one-half of a penny} &= 1 \text{ halfpenny.} \\ \frac{3}{4} &= \text{three-fourths of a penny} &= 3 \text{ farthings.} \end{aligned}$$

**How Taught.**—The compound rules should be taught by *Comparison* and *Contrast* with the Simple Rules. The two may be connected, and by carefully framed examples the class may be led to discover the rules for compound addition for themselves. But first of all the necessary tables should have been learned,



and plenty of mental exercises should be given on them. Set the following example on B.B. :—

£	s.	d.	£	s.	d.	f.
3	4	2½	3	4	2	1
5	9	7½	5	9	7	2
6	8	3½	6	8	3	3
2	6	8½	2	6	8	2
<hr/>			<hr/>			<hr/>
17	8	10	16	27	20	8
<hr/>			<hr/>			<hr/>
			1	1	2	2 + 0
<hr/>			<hr/>			<hr/>
			17	28	22	
<hr/>			<hr/>			<hr/>
				1 + 8	1 + 10	

(a) Make a simple addition of each column, and let the class add them.

(b) The "compound" element comes in in two ways :—

1. In the conversion of the total in each case; e.g., 22 pence become 1 shilling and 10 pence.
2. In the carrying; 22 pence do not give 2 and carry 2 as in simple addition, but the 10 pence are placed under the pence column and the 1 shilling is carried to the shillings column.

The difference will thus be seen to be one of denomination. In the *simple* the sum is divided by 10 always; in the compound by 20, 12, or 4, or other numbers depending on the tables used. The reason for leaving the farthings blank should be pointed out. The principle is the same for compound subtraction.

### The Compound Rules Criticised.

1. They are cumbrous and difficult to learn.
  2. They are extravagant in time and energy.
  3. The Metric System, if adopted in its entirety, would render their existence unnecessary, and would make the work simpler, swifter, and more economical.
  4. They militate against our trade on the authority of good judges. Foreign nations, in some cases, are showing some reluctance to be bothered with trade transactions involving a knowledge of our cumbrous system.
- Nevertheless, there are serious *objections* to changing the system, although it would be better if a national effort were made to overcome these. The change would be a shock to custom, to habit, and to business. It would also be very expensive, for the coinage would have to be recast. There is also the reluctance of adults to be bothered with the learning of any new system.

### COMPOUND SUBTRACTION.

1. Recapitulate simple subtraction as applied separately to pounds, shillings, pence, and farthings, thus :—

£	s.	d.	f.
1684	384	261	813
1297	196	199	724
<hr/>			

Give easy examples of compound subtraction, e.g. :—

£	s.	d.	£	s.	d.
18	19	10½	728	16	8½
4	13	5½	613	8	3½
<hr/>			<hr/>		

Such examples as these present no difficulty, and are understood at once.

3. Follow with more difficult examples in which "borrowing" is necessary.  
The result can be obtained—

- (a) By the method of decomposition.  
(b) By the method of equal additions.  
(c) By the method of complementary addition.

**By Decomposition.**

$$\begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 1983 \quad 14 \quad 4\frac{1}{4} \\
 694 \quad 16 \quad 8\frac{3}{4} \\
 \hline
 \end{array}
 =
 \begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 1982 \quad 33 \quad 15\frac{1}{2} \\
 694 \quad 16 \quad 8\frac{3}{4} \\
 \hline
 1288 \quad 17 \quad 7\frac{1}{2}
 \end{array}$$

**Equal Additions.**

$$\begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 1983 \quad 14 \quad 4\frac{1}{4} \\
 694 \quad 16 \quad 8\frac{3}{4} \\
 \hline
 \end{array}
 =
 \begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 1983 \quad 34 \quad 16\frac{1}{2} \\
 695 \quad 17 \quad 9\frac{3}{4} \\
 \hline
 1288 \quad 17 \quad 7\frac{1}{2}
 \end{array}$$

**Complementary Addition.**

$$\begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 1983 \quad 14 \quad 4\frac{1}{4} \\
 \hline
 694 \quad 16 \quad 8\frac{3}{4} \\
 1288 \quad 17 \quad 7\frac{1}{2}
 \end{array}
 = \text{the complementary addition made.}$$

4. Introduce examples with missing denominations. The process is the same as before. Take as an example £19 or. 4d. - £7 8s. 5½d.

	Decomposition.	Equal Additions.	Compl. Addition.
$  \begin{array}{r}  \text{£} \quad \text{s.} \quad \text{d.} \\  19 \quad 0 \quad 4 \\  7 \quad 8 \quad 5\frac{1}{2} \\  \hline  11 \quad 11 \quad 10\frac{3}{4}  \end{array}  $	$  \begin{array}{r}  \text{£} \quad \text{s.} \quad \text{d.} \\  18 \quad 19 \quad 15\frac{1}{4} \\  7 \quad 8 \quad 5\frac{1}{2} \\  \hline  11 \quad 11 \quad 10\frac{3}{4}  \end{array}  $	$  \begin{array}{r}  \text{£} \quad \text{s.} \quad \text{d.} \\  19 \quad 20 \quad 16\frac{1}{4} \\  8 \quad 9 \quad 6\frac{1}{2} \\  \hline  11 \quad 11 \quad 10\frac{3}{4}  \end{array}  $	$  \begin{array}{r}  \text{£} \quad \text{s.} \quad \text{d.} \\  19 \quad 0 \quad 4 \\  \hline  7 \quad 8 \quad 5\frac{1}{2} \\  11 \quad 11 \quad 10\frac{3}{4}  \end{array}  $

**COMPOUND MULTIPLICATION.**

**By One Figure.**

1. The class should have previously learned the pence and shillings tables, and should have received plenty of exercises in mental arithmetic preparatory to compound multiplication. Assuming this to have been done, the pupils should then be ready mentally to proceed as follows:—

Take as an example £18 13s. 7½d. × 5.

$$\begin{array}{r}
 \text{£}18 \times 5 = \text{£}90 = 90 \quad 0 \quad 0 \\
 13\text{s.} \times 5 = 65\text{s.} = 3 \quad 5 \quad 0 \\
 7\text{d.} \times 5 = 35\text{d.} = 0 \quad 2 \quad 11 \\
 \frac{1}{2} \times 5 = 15\text{f.} = 0 \quad 0 \quad 3\frac{1}{2} \\
 \hline
 \therefore \text{£}18 \quad 13\text{s.} \quad 7\frac{1}{2}\text{d.} \times 5 = \text{£}93 \quad 8\text{s.} \quad 2\frac{1}{4}\text{d.}
 \end{array}$$

2. Set out the example on the B.B., and work it by the ordinary method. The class will readily understand the reason of the rule from the analysis given in the previous step. They will see that the *principle* is the same as in simple multiplication, but that the *denominations* vary. In simple multiplication it is always 10; in compound it varies, being 10 for the pounds, because 10 is the basis; 20 for the shillings, because 20s. = £1; 12 for the pence, because 12d. = 1s.; and being 4 for the farthings, because 4 farthings = 1d.

$$\begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ 18 \quad 13 \quad 7\frac{3}{4} \\ \hline 93 \quad 8 \quad 2\frac{1}{4} \end{array}$$

The class thus discovers what the *practice* is, *viz.*, to reduce each denomination to the next higher denomination, *e.g.*—

farthings to pence (d)  
pence to shillings (s)  
shillings to pounds (£).

3. Plenty of exercises should be given for practice.

### By Two Figures.

Take as an example £4 13s. 6½d. × 49.

1. Take the same digits 41362 and multiply as in simple multiplication—

$$\begin{array}{r} 41362 \\ 49 \\ \hline 372258 \\ 165448 \\ \hline 2026738 \end{array} \quad \begin{array}{l} 49 \text{ decomposed} = 40 + 9 \\ = 9 \times 41362 \\ = 40 \times 41362 \\ = 49 \times 41362 \end{array}$$

2. Now factor or decompose 49 in other ways and compare them—

$$\begin{array}{r} 49 = 40 + 9 = (4 \times 10) + 9 \\ \text{£} \quad \text{s.} \quad \text{d.} \\ 4 \quad 13 \quad 6\frac{1}{2} \times 9 \\ \hline 10 \end{array} \quad \begin{array}{l} 46 \quad 15 \quad 5 \\ 4 \\ \hline 187 \quad 1 \quad 8 \\ 42 \quad 1 \quad 10\frac{1}{2} \\ \hline 229 \quad 3 \quad 6\frac{1}{2} \end{array} \quad \begin{array}{l} = 10 \times \text{£}4 \quad 13\text{s.} \quad 6\frac{1}{2}\text{d.} \\ = (1 \times 10) \times \text{£}4 \quad 13\text{s.} \quad 6\frac{1}{2}\text{d.} \\ = 9 \times \text{£}4 \quad 13\text{s.} \quad 6\frac{1}{2}\text{d.} \\ = 49 \times \text{£}4 \quad 13\text{s.} \quad 6\frac{1}{2}\text{d.} \end{array}$$

3. Lead the class to grasp intelligently the following facts:—

- Factor or decompose the multiplier.
- Multiply each factor in its proper position.
- Multiply farthings and reduce to pence; multiply pence and reduce to shillings; shillings to pounds.
- Never place a cypher in the farthing product—in the example given it would convert the 5d. into 50d. if a cypher were added to indicate the absence of farthings.
- The *principle* is the same both in simple and compound, but the *denomination* is different.

**Different Methods.**—There are several methods of working multiplication—(1) By factors; (2) By decomposition; (3) Without factors or decomposition; (4) By special method; (5) By practice.

Here the first four methods only will be considered. The same example should be worked by each method on the B.R., the teacher explaining each step as he introduces it; but this should not be done too soon, as it brings obscurity instead of clearness.

**By Factors.**

$$\begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ 4 \quad 13 \quad 6\frac{1}{2} \times (7 \times 7). \\ \hline 7 \end{array}$$

$$\begin{array}{r} 32 \quad 14 \quad 9\frac{1}{2} = 7 \text{ times top line.} \\ \hline 7 \end{array}$$

$$220 \quad 3 \quad 6\frac{1}{2} = 7 \times 7 \text{ times top line.}$$

**Special Method.**

$$\begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ 4 \quad 13 \quad 6\frac{1}{2} \times (50 - 1). \\ \hline 10 \end{array}$$

$$\begin{array}{r} 46 \quad 15 \quad 5 = 10 \text{ times top line.} \\ \hline 5 \end{array}$$

$$\begin{array}{r} 232 \quad 17 \quad 1 = 5 \times 10 \text{ times top line.} \\ 4 \quad 13 \quad 6\frac{1}{2} = 1 \text{ times top line.} \\ \hline \end{array}$$

$$220 \quad 3 \quad 6\frac{1}{2} = (50 - 1) = 49 \text{ lines.}$$

**Direct Method.**

£	s.	d.	farthings.	pence.	shillings.	pounds.
4	13	6½ × 49	49	49	49	49
		49	2	6	13	4
<hr/>						
220	3	6½	4)98	294	147	196
			24½	24	49	33
				12)318	637	229
				26		
				26'6		
					20)663	
						33'3

The method by decomposition has already been demonstrated.

**Remarks on the Methods.**

1. It is claimed that the direct method ensures greater accuracy, but it is long and tedious in the setting out. It dispenses with the necessity for learning the compound tables, but what it may gain in accuracy it undoubtedly loses in time.
2. The special method is the best. Special methods usually are when available. The multiplication of 10 is easier than that of 7, while to subtract the top line is easier than to multiply by 9 and add.
3. Next to the special method factoring should be used where possible.
4. The method of decomposition is the one usually employed, because it lends itself to all cases.
5. Eventually all methods should be taught.
  - (a) The *mental training* is better. It helps to break the unintelligent rule of thumb work, now rapidly becoming a thing of the past in our schools. It develops more mental resource by more fully revealing the truths contained.
  - (b) It cultivates perception, and so gives *greater practical skill*. The child is taught to see readily the several methods of solution available.
  - (c) It develops *confidence* from a recognised wealth of working means.
  - (d) It adds *interest* from the variety of treatment.

**COMPOUND DIVISION.**—Compound division is the arithmetic process by which we find how many times one compound

quantity is contained in another, or by which, as nearly as possible, we divide a given compound quantity into a given number of equal parts. As in simple division, the process may be either "short" or "long," but the principle involved is the same in each case, and is merely an adaptation of the simple rule. The divisor may be either an abstract quantity as 492; or a concrete quantity like £14 13s. 7½d. The teacher must deal with abstract divisors first.

**When the Divisor is an Abstract Number.**

**Short Division.**—Take as an example £9 18s. 3½d. ÷ 4, and explain the work as follows:—

$$\begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 4 \overline{) 9 \quad 18 \quad 3\frac{1}{2}} \\
 \underline{2 \quad 9 \quad 6\frac{1}{2}} \quad + 2 \\
 \text{£} 2 + \text{£} 1 \text{ over, or } 20\text{s. over.} \\
 \text{s. } \frac{18 + 20}{4} = \frac{38}{4} = 9\text{s.} + 2\text{s. over, or } 24\text{d. over.} \\
 \text{d. } \frac{3 + 24}{4} = \frac{27}{4} = 6\text{d.} + 3\text{d. over, or } 12\text{f. over.} \\
 \text{f. } \frac{2 + 12}{4} = \frac{14}{4} = 3\frac{1}{2} + 2\text{f. over.}
 \end{array}$$

The teacher should then expect the class to *discover the rule*, and to get a thorough grasp of the following truths:—

- (a) £9 contain 2 groups of £4 and £1 over, or 20s.
- (b) 18s. and the 20s. over give 38s., which contain 9 groups of 4s. and 2s. over, or 24d.
- (c) 3d. and 24d. give 27d., which contain 6 groups of 4d. and 3d. or 12f. over.
- (d) ½ or 2f. and 12f. give 14f., which contain 3 groups (¾) of 4, and 2f. over.

The rule might then be stated by the class in some such words as these:—

*Find how many times the divisor (4) is contained in the highest denomination (£9) of the dividend, and place the result in the quotient under that denomination; then reduce the remainder (£1) to the next lower denomination (shillings), and add them to the shillings in the dividend (18 + 20); then find how many times the divisor (4) is contained in 38s., and place the result in the quotient under the shillings; and proceed similarly with the remaining terms of the dividend.*

**Long Division.**—Long division presents no new principle. As in simple division, the principle is the same as in short division, but less work is done mentally, and more is set out on the paper. The example given above might be worked by long division, and the two processes compared. The teacher should aim at neat methods of setting out the work. Very little difficulty need be anticipated in the mastery of this rule.

Having briefly recapitulated the different kinds of division, the comparison might be carried still farther and include "simple" long division. The same integers could be used in each case, e.g.,  $\text{£}9\ 18s. 3d. \div 4$  (short division),  $\text{£}9\ 18s. 3d. \div 4$  (long division), and  $9183 \div 4$  (simple long division). The concrete nature of the quotient, the reduction of one denomination to another (pounds to shillings, etc.), and the division into each denomination after reduction should be contrasted with the purely abstract homogeneous nature of the ordinary process in "simple" division. The class should then be able to grasp clearly the difference between the two processes, which is practically one of reduction. In "compound" division, having exhausted a denomination, the remainder is then reduced to the next lower denomination and the division is repeated. Excepting that the nomenclature, owing to the different denominations involved, is different from "simple" division, both in the dividend and the quotient, the process then is the same as that for the simple rule, so long as the divisor is an abstract quantity.

**The Compound Tables.**—Their *common uses* may be briefly enunciated as follows:—

**1. Money.**—For buying and selling. Wages, interest, discount, rent, etc., are really cases of buying and selling.

**2. Avoirdupois.**—Coals, bread, potatoes, butter, cheese, and many other articles of domestic and everyday life are bought by avoirdupois; in the trades, tons of iron, stone, minerals, etc., are bought and sold; in the manufactures, for the measurement of force, of cargoes, loads, and our own weight; the weight of the atmosphere, and in an infinity of ways, this table is in constant use.

**3. Liquid.**—This will include ale and beer measure and wine measure. But beyond barrels and gallons it is scarcely necessary to go. Milk, beer, porter, etc., are bought by the masses in small quantities—the half pint, the pint—rarely in quarts, gallons, or barrels. Stout is usually sold by the bottle, wine by the bottle also; spirits in small quantities and by the bottle. Non-intoxicating drinks are usually sold in bottles, while water is generally measured by gallons.

**4. Long Measure.**—For measuring distance, great or small; e.g., a man walks so many miles; a ship steams or sails so many knots; one runs so many yards in so many seconds, etc. It is largely used in mathematical geography and in astronomy, in all sorts of trades, in shopping, in estimating our own height, etc.

**5. Square Measure.**—This table is required for boys only. It is used for surveying land, for the sale of carpets, oil cloths, ordinary cloths, calicoes and stuffs; for the wood trades, like the lumber trade, carpentry, and cabinet making; for the measurement of surfaces, whether land or water, and for many other purposes which will be within the experience or knowledge of the children.

**6. Cubic Measure.**—For the estimation of bulk, volumes, gases, solid bodies, etc.

**7. Time Measure.**—The clock, watch, and chronometer sufficiently indicate the use of this table. Time is sometimes a measurement of space to be covered, as in trains and boats; of wages to be paid, as with workmen; of day and night; of weeks, months, years, centuries, cycles of time, etc. It is also used in longitude.

**8. Capacity.**—Some vegetables and fruits fall under this table. We speak of a bushel of potatoes, a sieve of apples, a peck of peas, a gallon of apples, etc.

**9. Troy and Apothecaries.**—These are not common tables, and should only be taught under special circumstances.

In teaching the compound rules under weights and measures, the same methods should be adopted as in the case of compound money rules. The principles will be the same; the tables with their varying denominations will furnish the only difference.

#### NOTES OF A FIRST LESSON ON LONG MEASURE.

**Class.**—Standard IV.

**Time.**—Forty-five minutes.

**Apparatus.**—Foot ruler for each child; B.B., etc.; yard measure.

Steps.	Method.	Matter.
I. To teach 12 inches make 1 foot.	Ask children for length of ruler before them. Let them measure length of desk with ruler. The ruler measures it (say) three times <i>and there is a piece of the desk over</i> . Hence deduce the necessity of a smaller measure than the foot. Then proceed to teach what is in the matter column.	<b>A foot ruler is divided into twelve equal parts, each called an inch.</b> <b>12 inches = 1 foot.</b>
II. To teach the reduction of feet to inches.	(a) <b>By actual measurement.</b> Place two foot rulers end to end. Let child <i>count</i> number of inches. Repeat with three and four rulers. Ask how we can find the number of inches in two, three or four feet <i>without counting</i> . Compare with reduction of shillings to pence. (b) <b>By mental examples.</b> Give five or six examples. (c) <b>By examples worked on B.B.</b> Let these be a little more difficult than the mental examples, e.g., Piece of string is 7 feet long. [A] 12 " " " 84 inches long.	<b>To reduce feet to inches multiply by 12.</b>  (b) <i>E.g.</i> , How many pieces of string, each an inch long, can be cut from 4 ft. of string?
III. To teach reduction of inches to feet.	(a) <b>By mental examples.</b> Ask questions. Deduce rule. Compare with reduction of pence to shillings. (b) <b>By examples worked on B.B.</b> (See B.B. Sketch [B]).	<b>To reduce inches to feet divide by 12.</b> (a) <i>E.g.</i> , How many inches in 5 feet, etc.?
IV. To teach that 3 feet make 1 yard.	Let child measure length of room with foot rule. Ask how some of the stooping and measuring could be prevented. Introduce and name <i>yard</i> measure. See how many foot rulers placed end to end make one yard.	<b>3 feet = 1 yard.</b>
V. To teach reduction of yards to feet.	Proceed as in Step II., using, of course, 3 in place of 12. (See B.B. Sketch [C]).	<b>To reduce yards to feet multiply by 3.</b>
VI. To teach reduction of feet to yards.	Proceed as in Step III., using, of course, 3 in place of 12. (See B.B. Sketch [D]).	<b>To reduce feet to yards divide by 3.</b>

Steps.	Method.	Matter.
VII. To teach more difficult examples in descending reduction.	<p>(a) <b>By actual counting.</b> Draw line 1 ft. 9 in. on B.B. Let child step it off into inches [E].</p> <p>(b) <b>By mental examples.</b> Give three or four examples. Then proceed to get rule from class.</p> <p>(c) <b>By examples worked on B.B.</b> (See B.B. Sketch [F] and [G].) now the superiority of [G] over [F]. Be careful to name each quantity.</p>	To reduce yards, feet and inches to inches, multiply the yards by 3 and add in any feet, then multiply the result by 12 and add in any inches.
VIII. To teach more difficult examples in ascending reduction.	<p>Take an example already dealt with in descending reduction [II] and reduce the inches back to yards, etc. [I].</p> <p>Obtain reasons as in Step III.</p> <p>Again insist on the importance of naming each quantity.</p>	To reduce inches to yards, divide by 12 to reduce to feet, then by 3 to reduce to yards.
IX. Practice by Class.	Give examples for the class to work.	E.g., A boy is 3 ft. 10 in. high. How many inches is that?

**B.B. SKETCH.**

12 inches make 1 foot.  
3 feet „ 1 yard.

[A] \* Piece of string 7 ft. long.

[B] 12)86 inches.

12  
„ „ 84 in. long.

8 feet.

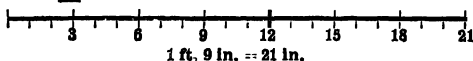
[C] 5 yds.

[D] 3)24 ft.

3  
15 ft.

8 yds.

[E]



[F] 6 ft. 4 in.

[G] 6 ft. 4 in.

12  
72 in.  
4  
76 in.

12  
76 in.

[H] 2 yds. 2 ft. 6 in.

[I] 12)102 in.

3  
8 ft.  
12  
102 in.

3)8 ft. 6 in.  
2 yds. 2 ft. 6 in.

**THE G.C.M. OR THE H.C.F.** This process is known as finding the Greatest Common Measure or the Highest Common Factor of

\* The letters [A] to [I] are for reference only and would not appear in the actual B.B. Sketch.



two or more numbers. The children should be familiarised with both terms, but perhaps the second one is preferable. The connection between the two terms should be shown.

1. Take as an example the H.C.F. of 168 and 280.

$$\begin{array}{l} 168 = 3 \times 7 \times 8 \therefore 3 \text{ is a factor of } 168 \\ \quad \text{and } 7 \quad \quad \quad \text{and } 8 \\ 280 = 5 \times 7 \times 8 \therefore 5 \quad \quad \quad 280 \\ \quad \text{and } 7 \quad \quad \quad \text{and } 8 \end{array}$$

Now 7 is found in both  $\therefore$  it is a common factor of both.

and 8 " " " " " " " " " " " "

$\therefore 7 \times 8$  or 56 is a common factor of both.

Then we have 3 factors common to both, 7, 8, and 56. For the quantities can be expressed

$$\begin{array}{ll} \text{as } 5 \times 7 \times 8 = 280 & \text{or as } 5 \times 56 = 280 \\ \text{and as } 3 \times 7 \times 8 = 168 & \text{or as } 3 \times 56 = 168. \end{array}$$

Of these 3 common factors 56 is the greatest or highest  $\therefore$  56 is the H.C.F. of 168 and 280.

2. Now work the sum by the ordinary process, explaining the rule as you go.

$$\begin{array}{r} 168 \overline{)280(1} \\ \underline{168} \phantom{(1} \\ 112 \overline{)168(1} \\ \underline{112} \phantom{(1} \\ 56 \overline{)112(2} \\ \underline{112} \phantom{(2} \\ 0 \end{array}$$

The rule is to divide the smaller number into the larger, and let the divisor of one step become the dividend of the next, until there is no remainder. The last divisor then becomes the H.C.F.

3. Then illustrate the truth of the process in the following way, which is recommended for its simplicity and its graphic nature, the usual methods of explanation being a little too difficult for some of the children.

$$\begin{array}{r} 56 \times 3 \overline{)56 \times 5(1} \\ \underline{56 \times 3} \phantom{(1} \end{array}$$

$$\begin{array}{r} 56 \times 2 \overline{)56 \times 3(1} \\ \underline{56 \times 2} \phantom{(1} \end{array}$$

$$\begin{array}{r} 56 \times 1 \overline{)56 \times 2(2} \\ \underline{56 \times 1} \phantom{(2} \end{array}$$

By this method the pupil sees the *reason* of the process, and notices that 56 is a common measure of the two numbers; for it is a common factor of every divisor, dividend, and subtrahend in the operation. It is therefore *common* to both, and as it has been shown to be the *greatest factor*, it is there-

fore the Highest Common Factor of 168 and 280.

4. The Usual Reason for the Process might be given later on as follows. Take any two numbers, as 35 and 112, and factor them.

$$35 = 7 \times 5; 112 = 7 \times 16.$$

Then 7 is a common factor of 35 and 112;

And 7 is also a factor of their *sum*, i.e., of  $35 + 112$ , or 147.

And 7 is also a factor of their *difference*, i.e., of  $112 - 35$ , or 77.

Also 7 is a factor of  $6 \times 35$ , or any other multiple of 35.

And 7 is a factor of  $8 \times 112$ , or any other multiple of 112.

From a study of these truths the class ought to be able to enunciate the following proposition:—

*A Common Factor of any two numbers is also a factor of their sum, of their difference, and of any multiple of either of them.*

The reason for the process will be found to depend on this proposition. For take the two original numbers 168 and 280.

Any number which measures 280 and 168 also measures their *difference*, 112.

It is also a measure of the *difference* of 168 and 112, i.e., 56.

It therefore measures any *multiple* of 56, as  $1 \times 56$ .

And therefore since 56 is a factor of itself and of 112, it is also a factor of 168 and 280.

Also 56 is the *Highest Common Factor* of the given numbers, for it has been shown that any number which is a factor of 168 and 280 is also a factor of 56, and since 56 is the *highest factor of itself*, it is the *Highest Common Factor* of 168 and 280.

5. As soon as possible the teacher should accustom the class to set their work out by the short method, as it is much neater and better training. The work is shown in parallel columns, more of it being done mentally, the answer to each subtraction only being shown.

$$\begin{array}{r|l} 168 & 280 \\ \hline 56 & 112 \end{array} \quad 56 \text{ being the H.C.F.}$$

## LEAST COMMON MULTIPLE.

**I. Prime Factors.**—First show the class how to reduce any given number to its *prime* factors, as a knowledge of this is necessary for the proper understanding of the process by which the L.C.M. is found. Take 7560 as an example.

- (a) The class will notice that the factors must be *prime*, i.e., they are divisible by no other number.

- (b) The prime factors consist of all the divisors and the last quotient.

- (c) The factors multiplied together equal the given number, e.g.—

$$\begin{array}{r} 7 \overline{) 7560} \\ 3 \overline{) 1080} \\ 3 \overline{) 360} \\ 3 \overline{) 120} \\ 2 \overline{) 40} \\ 2 \overline{) 20} \\ 2 \overline{) 10} \\ 5 \end{array}$$

$$7 \times 3 \times 3 \times 3 \times 2 \times 2 \times 2 \times 5 = 7560.$$

**II. A Multiple.**—Next lead the class to discover what is meant by a multiple. Take any three numbers, as 56, 108, and 360, and deal with them thus:—

$$7 \times 2 \times 2 \times 2 = 56$$

$$3 \times 2 \times 2 \times 3 \times 3 = 108$$

$$2 \times 2 \times 3 \times 3 \times 2 \times 5 = 360$$

- (a) The class is to note that in each case we have found the *prime factors* of each number.

- (b) That 56 is a *multiple* of 7, and 2, and 2, and 2.

That 108 is a *multiple* of 3, 2, 2, 3, and 3.

That 360 is a *multiple* of 2, 2, 3, 3, 2, and 5.

The term *multiple* should then be compared with the term *product*, with which they are already familiar.

**III. A Common Multiple.**—Take the prime factors of the 3 quantities and multiply together all their prime factors, e.g.—

$(7 \times 2 \times 2 \times 2) \times (3 \times 2 \times 2 \times 3 \times 3) \times (2 \times 2 \times 3 \times 3 \times 2 \times 5) = 2177280.$

Then 2177280 is a multiple of 56, for it contains the prime factors of 56

It is also a multiple of 108, for it contains the prime factors of 108.

It is also a multiple of 360, for it contains the prime factors of 360.

It is therefore a multiple *common* to them all, *i.e.*, it is a *common multiple* of them all.

#### IV. The Least Common Multiple.

$(7 \times 2 \times 2 \times 2)$  is a multiple of 56, because it contains  $(7 \times 2 \times 2 \times 2)$  the prime factors of 56.

And  $(7 \times 2 \times 2 \times 2) \times (3 \times 3 \times 3)$  is a multiple of 108, because it contains  $(3 \times 2 \times 2 \times 3 \times 3)$  the prime factors of 108. It is also a multiple of 56, because it contains  $(7 \times 2 \times 2 \times 2)$  the prime factors of 56. It is therefore a *common multiple* of 56 and 108.

Again  $(7 \times 2 \times 2 \times 2) \times (3 \times 3 \times 3) \times (5)$  is a multiple of 360, because it contains  $(2 \times 2 \times 3 \times 3 \times 2 \times 5)$  the prime factors of 360. It is also a multiple of 108, for it contains  $(3 \times 2 \times 2 \times 3 \times 3)$  the prime factors of 108; it is also a multiple of 56, for it contains  $(7 \times 2 \times 2 \times 2)$  the prime factors of 56. It is therefore a *common multiple* of 360, 108, and 56. It is also the *least common multiple*, because the *least number possible of prime factors* is taken to produce it. Therefore  $7 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5$  or 7560 is the *least common multiple* of 56, 108, and 360.

**How to Find the L.C.M.**—Take as an example 2, 4, 6, 7, 21, 32.

Now  $4 = 2 \times 2$ ; hence 2 is a factor of 4, and 4 is a multiple of 2.

And  $32 = 4 \times 8$ ; " 4 " 32, " 32 " 4.

And  $21 = 7 \times 3$ ; " 7 " 21, " 21 " 7.

From which it is evident that *if one number contains another number an exact number of times, the number which contains the other is a multiple of that other.* Hence we may leave out of consideration all those numbers which are factors of other numbers.

Now it has been shown that 2 is a factor of 4,

and that 4 " 32,

and that 7 " 21,

∴ the numbers 2, 4, and 7 may at once be struck out, thus:—

$$2 \mid 4, 6, 7, 21, 32$$

$$4, 21, 16$$

$$\text{And L.C.M.} = 2 \times 21 \times 16 = 672.$$

Next 2 is a common measure of 6 and 32, hence divide them by 2.

Next 3 is a factor of 21, and can therefore be struck out.

There is no factor beyond unity common to 21 and 16, hence the L.C.M. will be the product of the divisors into the remaining quotients (21, 16).

$$\text{i.e., L.C.M.} = 2 \times 21 \times 16 = 672.$$

**Another Method.**—Reduce 2, 4, 6, 7, 21, and 32 to their prime factors.

$$2 = 2$$

$$4 = 2 \times 2$$

$$6 = 2 \times 3$$

$$7 = 7$$

$$21 = 3 \times 7$$

$$32 = 2 \times 2 \times 2 \times 2 \times 2$$

Then L.C.M. of 2 is 2.

And " 4 and 2 is  $2 \times 2$ .

" " 6 and 4 and 2 is  $3 \times 2 \times 2$ .

" " 7 and 6 and 4 and 2 is  $7 \times 3 \times 2 \times 2$ .

" " 21 and 7 and 6 and 4 and 2 is  $7 \times 3 \times 2 \times 2$ .

" " 32 and 21 and 7 and 6 and 4 and 2 is  $2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 3 = 672$ .

The first method is the safer one, and a harder example worked by that method is here given.

Find L.C.M. of 12, 16, 18, 28, 32, 40, 42.

2 | 12, 16, 18, 28, 32, 40, 42    16 is contained in 32.

2 | 6        9, 14, 16, 20, 21

2 | 3,        9, 7, 8, 10, 21    3 and 7 are contained in 21.

3 |        9,        4, 5, 21

3,        4, 5, 7

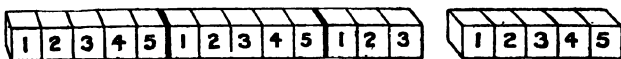
L.C.M. =  $2 \times 2 \times 2 \times 3 \times 3 \times 4 \times 5 \times 7 = 10080$ .

**VULGAR FRACTIONS.**—The practice adopted in many Arithmetics of postponing the teaching of fractions until after the compound rules have been mastered is hardly to be recommended. Where a child has mastered the four simple rules there is no reason why he should not at once proceed to learn fractions, both decimal and vulgar. The work involved is at least as easy as that involved in the working of the compound rules, and probably easier. When all those rules usually found intervening between simple division and fractions are learned, they can then be treated with more accuracy in practice and more profit to the mind. There will be no rejecting of fractions of a penny, and less restriction on the kind of example set for solution.

The *idea* of a fraction is easily given to children, and requires no elaborate teaching. Two apples might be taken, one of which might be cut into four equal parts, and the other into four unequal parts. To the equal parts we give the name of fractions, and to the unequal parts fragments. The class thus gets a clear idea of the fundamental attribute of a fraction, *viz.*, equality of division. There remains the word "vulgar" to explain as meaning "common," and the class will then understand that they are dealing with common fractions. The concrete illustrations can be multiplied and varied, if necessary.

**Improper Fractions and Mixed Numbers.**

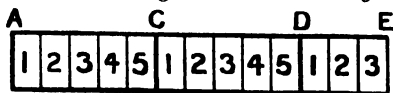
1. First explain and demonstrate the meaning of the terms Numerator and Denominator.
2. Then make the significance of a fraction clear by comparing the sign of division with a fraction; e.g.,  $\div$  and  $\frac{1}{2}$ . It will be seen that the dots are mere symbols representing any integers, or that the Numerator and Denominator take the places of the two dots.
3. Change  $\frac{13}{5}$  into a mixed number. The class will understand that there is a unit which is divided into 5 equal parts, and that 13 such parts are taken to form the fraction. Obviously there is more than one unit in the fraction.
4. Demonstrate with kindergarten cubes.



Show a unit to the class. It contains 5 equal cubes or parts. Take 13 such cubes and build up units from them. There are 2 units and 3 cubes left; i.e., 2 units and  $\frac{3}{5}$  of a unit, which may be expressed as  $2 + \frac{3}{5}$ , and is expressed thus— $2\frac{3}{5}$ . This is called a *mixed number*, because it is a mixture of whole numbers and a fraction.

The converse method can be similarly demonstrated.

**By Diagram.**—Draw a rectangle and divide it into 13 equal parts.



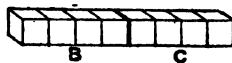
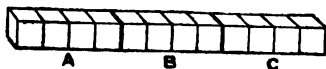
$$\begin{aligned}
 AC &= 1 \text{ unit} = 5 \text{ parts.} \\
 CD &= 1 \text{ unit} = 5 \text{ parts.} \\
 \therefore AD &= 2 \text{ units} = 10 \text{ parts.} \\
 \text{And } DE &= \frac{3}{5} \text{ units.} \\
 \therefore AE &= 2\frac{3}{5} \text{ units.} \\
 \text{But } AE &= 13 \text{ parts, or } \frac{13}{5} \text{ units.} \\
 \therefore \frac{13}{5} &= 2\frac{3}{5}.
 \end{aligned}$$

**Addition and Subtraction of Fractions.**

Vulgar Fractions can only be added or subtracted when expressed in terms of the same denomination. The meaning of this must be demonstrated to the class. Take following examples:—

Add  $\frac{2}{3}$  and  $\frac{3}{4}$ . Subtract  $\frac{3}{4}$  from  $\frac{2}{3}$ .

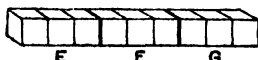
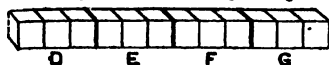
1. Take 12 kindergarten cubes of equal size and build these up into a unit. Divide these into 3 equal parts, as A, B, and C. Then separate 2 of



these parts as in fig. 2. The class will perceive that there are 2 parts out of 3, or 8 parts out of 12;

i.e., there are  $\frac{2}{3}$  or  $\frac{8}{12}$ .

2. Now take 12 similar cubes and divide them into 4 equal parts, as D, E, F, and G. Now separate 3 of these parts, as in fig. 4. The class will



perceive that here 3 parts out of the 4 have been removed, or 9 parts out of 12;

*i.e.*, there are  $\frac{3}{4}$  or  $\frac{9}{12}$ .

3. **Addition.**—Let the class count the cubes. There are 8 in one group and 9 in the other; or

$$8 + 9 = 17.$$

$$\text{i.e., } \frac{3}{4} + \frac{3}{4} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12} = 1\frac{1}{2} + \frac{1}{12} = 1 + \frac{5}{12} = 1\frac{5}{12}.$$

4. **Subtraction.**—There are 9 cubes in one and 8 cubes in the other group.

$$\text{Then } \frac{3}{4} - \frac{3}{4} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}.$$

5. Now explain the ordinary arithmetic process. The class will understand the principle of the work with the teacher's help. If not, repeat with cubes and supplement with *diagram*.

Draw a line AB, and divide it into 4 equal parts. Draw AD at right angles to AB, and divide it into 3 equal parts of the same length as the parts in AB. Complete the parallelogram.

Then AEFB =  $\frac{3}{4}$  or  $\frac{9}{12}$ .

And KGCB =  $\frac{3}{4}$  or  $\frac{9}{12}$ .

Adding we have  $\frac{3}{4} + \frac{3}{4}$ , or  $\frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12}$ .

Subtracting we have  $\frac{3}{4} - \frac{3}{4}$ .

*i.e.*, KGCB - AEFB =  $\frac{9}{12} - \frac{8}{12} = \frac{1}{12} = \frac{1}{12}$ .

6. **By Money.**—Deal with a shilling. Divide one shilling into 3 groups of 4d. each, and another shilling into 4 groups of 3d. each.

Then  $\frac{3}{4} + \frac{3}{4} = 8d. + 9d. = 17d. = 1s. 5d.$

	A	K		B
	1	2	3	4
	5	6	7	8
E	9	H	10	12
	D	G		C

### Multiplication of Fractions.

#### I. To Multiply a Vulgar Fraction by an Integer.—Take

$\frac{5}{8} \times 4$  as an example.

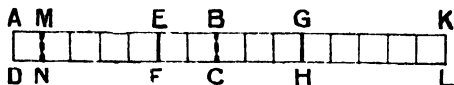
1. **By Addition.**— $\frac{5}{8} \times 4 = \frac{5}{8} + \frac{5}{8} + \frac{5}{8} + \frac{5}{8} = \frac{20}{8} = 2\frac{4}{8} = 2\frac{1}{2}$ .

2. **By Diagram.**—Take  $\frac{5}{7} \times 3$  as an example.

Use coloured chalks to mark the various divisions.

As the new numerator will contain 15 units, 15 divisions will be required.

The pupil will soon understand this.



Let fig. ABCD = unity, *i.e.*, it will contain 7 divisions.

Then AMND =  $\frac{1}{7}$  of a unit

and AEFB =  $5 \times$  AMND =  $\frac{5}{7}$  of a unit

also  $3 \times$  AEFB =  $3 \times \frac{5}{7} =$  AKLD =  $2\frac{1}{7}$ .

3. **By Money.**—Use a guinea as the unit and take the same example.

Then  $\frac{1}{7}$  of a guinea = 3 shillings

and  $\frac{5}{7}$  " " =  $5 \times 3 = 15$  shillings

and  $3 \times \frac{5}{7}$  " " =  $3 \times 15 = 45$  shillings

= 2 guineas + 3 shillings =  $2\frac{3}{7} = 2\frac{1}{2}$

## 4. Other Methods.

- (a) Four *apples* may be taken and cut into 8 equal parts each, 5 of these parts being taken in each case.  
 (b) Small *cubes* may be used. Eight would form a figure which would represent unity, and 5 parts could be taken from each.

The work could thus be set on the B.B., taking  $\frac{5}{8} \times 4$  as an example.

$$5 \times 4 = 20$$

and 5 eighths  $\times 4 = 20$  eighths  
*i.e.*,  $\frac{5}{8} \times 4 = \frac{5 \times 4}{8} = \frac{20}{8} = 2\frac{1}{2}$ .

Or again, 5 eighths  $\times 4 = 20$  eighths, or 5 halves  
*i.e.*,  $\frac{5}{8} \times 4 = \frac{5}{2} = 2\frac{1}{2}$ .

*N.B.*—When possible divide the denominator for choice, since the product will then be expressed in its lowest terms

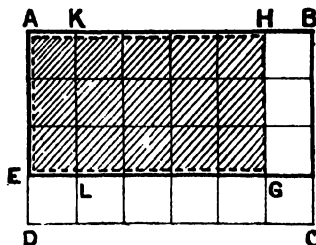
**Rule Deduced.**—To multiply a vulgar fraction by an integer, either multiply the numerator or divide the denominator by that integer.

## II. To Multiply a Vulgar Fraction by a Vulgar Fraction.—

Take  $\frac{5}{8}$  of  $\frac{3}{4}$  as an example.

1. **By Diagram.**—In constructing the figure let the pupils notice that the 2 denominators must be multiplied together to determine the number of little squares necessary, *i.e.*, they represent a rectangle 6 by 4.

Draw AB and divide it into 6 equal parts. Draw AD at right angles to AB and equal to 4 of these equal parts. Complete the rectangle ABCD. Through each of the points of division draw lines parallel to AB and AD. Then let ABCD = unity.



Then AEFB =  $\frac{3}{4}$  of ABCD  
 and AELK =  $\frac{1}{6}$  of AEFB =  $\frac{1}{6}$  of  $\frac{3}{4}$   
 and AEGH =  $\frac{5}{6}$  of AEFB =  $\frac{5}{6}$  of  $\frac{3}{4}$ .  
 Then AEGH is the figure required.  
 But AEGH contains 15 squares,  
 and the total number of squares is 24,  
 $\therefore$  AEGH is  $\frac{15}{24}$  of the whole,  
*i.e.*,  $\frac{5}{8} \times \frac{3}{4} = \frac{15}{32}$ .

## 2. By Money.

Take  $\frac{5}{8}$  of  $\frac{3}{4}$  of £1 as an example.

$$\begin{aligned} \frac{1}{4} \text{ of } £1 &= 5s. \\ \frac{3}{4} \text{ of } £1 &= 3 \times 5 = 15s. \\ \text{and } \frac{1}{8} \text{ of } \frac{3}{4} &= \frac{1}{8} \text{ of } 15 = 2s. 6d. \\ \text{and } \frac{5}{8} \text{ of } \frac{3}{4} &= 5 \times 2s. 6d. = 12s. 6d. \\ \text{i.e., } \frac{5}{8} \times \frac{3}{4} &= \frac{15}{32} \text{ of } £1 = 12s. 6d. \end{aligned}$$

## 3. Generally.

To find  $\frac{3}{4}$  of  $\frac{5}{8}$ , the  $\frac{5}{8}$  must be divided into 4 equal parts, and 3 of these parts must be taken.

Then each part is  $\frac{5}{32}$ , and 3 such parts =  $\frac{5}{32} \times 3 = \frac{15}{32} = 1\frac{1}{32}$ .

But  $\frac{3}{4}$  of  $\frac{5}{8}$  is the same as  $\frac{3}{8}$  of  $\frac{5}{8}$ , for it means that  $\frac{5}{8}$  must be divided into 6 parts, and therefore each part is  $\frac{5}{48}$ , and 5 such parts =  $\frac{5}{48} \times 5 = \frac{25}{48} = 1\frac{1}{48}$ .

**Rule Deduced.**—To multiply by a vulgar fraction, multiply by its numerator and divide the product by its denominator; or to multiply

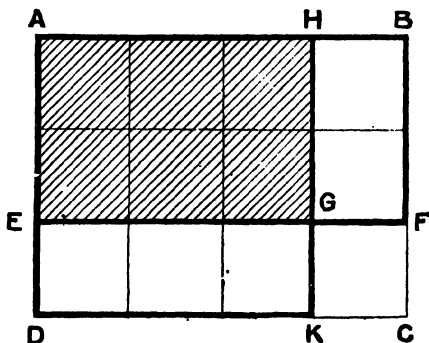
a fraction by a fraction, multiply the numerators for a new numerator and the denominators for a new denominator.

**III. To Prove Multiplier and Multiplicand can be Interchanged Without Altering the Product.**—To show that multiplicand  $\times$  multiplier = multiplier  $\times$  multiplicand.

$$\text{i.e., } \frac{2}{3} \times \frac{3}{4} = \frac{3}{4} \times \frac{2}{3}.$$

Do this by diagram, for the diagrams are useful to show the pupils how the product of 2 or more fractions may be *smaller* than either of the factors. This is otherwise a hard matter for the young mind to grasp, as it is apparently contrary to all their previous experience.

Let ABCD = the unit  
then AEFB =  $\frac{2}{3}$  of ABCD  
and AEGH =  $\frac{3}{4}$  of AEFB  
=  $\frac{3}{4}$  of  $\frac{2}{3}$  of ABCD.....(i.)  
=  $\frac{1}{2}$



Again let ABCD be the unit  
then ADKH =  $\frac{3}{4}$  of ABCD  
and AEGH =  $\frac{2}{3}$  of ADKH  
=  $\frac{2}{3}$  of  $\frac{3}{4}$  of ABCD.....(ii.)  
=  $\frac{1}{2}$

Hence comparing (i.) and (ii.) we see that  $\frac{2}{3} \times \frac{3}{4} = \frac{3}{4} \times \frac{2}{3}$ , for both equal  $\frac{1}{2}$ ; i.e., the multiplier and multiplicand can both be interchanged without altering the product.

**IV. Harder Examples.**—

Show that  $\frac{1}{2}(\frac{1}{3} - \frac{1}{4}) = \frac{1}{24}$  by a diagram (scholarship).

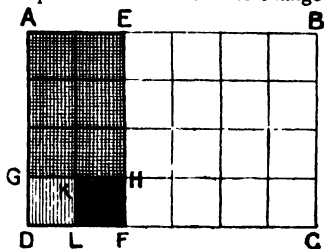
*Note.*—As the denominator of the product is 24 that number of squares will be required.

Let ABCD = unity =  $\frac{24}{24}$

then each square =  $\frac{1}{24}$

Now AEFB = 8 squares =  $\frac{8}{24} = \frac{1}{3}$

and AGHE = 6 squares =  $\frac{6}{24} = \frac{1}{4}$





Then  $AEFD - AEHG = GDFH = 2$  squares and the  $\frac{1}{2}$  of 2 squares = 1 square (KHFL)  $\therefore \frac{1}{2} (AEFD - AEHG) = KHFL = \frac{1}{2}$ ; i.e.,  $\frac{1}{2} (\frac{1}{2} - \frac{1}{4}) = \frac{1}{4}$ .

### DIVISION OF FRACTIONS.

Take as an example  $\frac{4}{5} \div \frac{6}{7}$ . Here we have to find a quotient which, when multiplied by  $\frac{6}{7}$ , shall give the product  $\frac{4}{5}$ .

Then  $\frac{6}{7}$  of this quotient =  $\frac{4}{5}$   
 therefore  $\frac{1}{7}$  „ „ =  $\frac{4}{5} \div 6$  or  $\frac{4}{5 \times 6}$   
 and therefore this quotient =  $\frac{4}{5 \times 6} \times 7$  or  $\frac{4 \times 7}{5 \times 6}$   
 but  $\frac{4 \times 7}{5 \times 6} = \frac{4}{5} \times \frac{7}{6}$   
 therefore  $\frac{4}{5} \div \frac{6}{7} = \frac{4}{5} \times \frac{7}{6}$ .

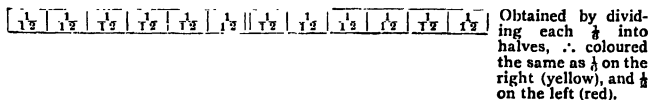
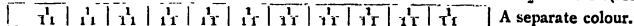
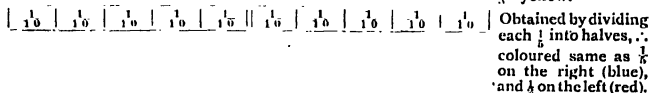
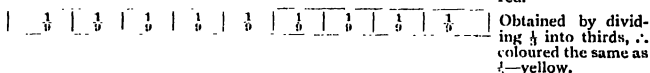
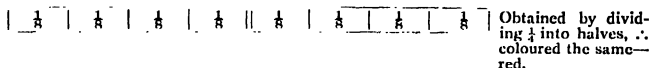
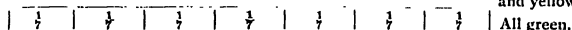
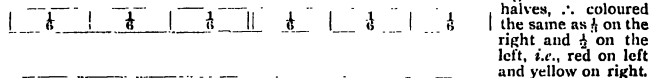
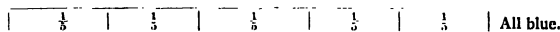
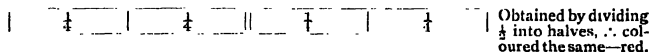
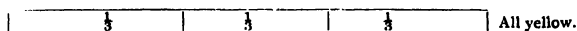
That is, to divide one fraction by another invert the divisor and multiply the dividend by the fraction thus inverted; or multiply the fraction by the reciprocal of the divisor.

### MECHANICAL AIDS FOR TEACHING FRACTIONS.—

There are several of these upon the market now, and the enterprise of different publishers keeps adding to their number. They are usually advertised with illustrations and explanations, and where the pupils cannot obtain the real thing, they are advised so far as it is possible to obtain specimens of these explanatory advertisements and to paste them in a book kept for that purpose. Two only are mentioned here as being typical, viz., *The Allied-Colour Fraction Chart*, and *Cowham's Fractions at a Glance*.

**The Allied-Colour Fraction Chart.\***—This chart illustrates the elementary principles of fractions and their relations to other fractions by means of related colours. The chart consists of twelve bars printed in various colours, each being distinctly marked from unity up to twelfths respectively. It is claimed for it that it is invaluable in teaching mental arithmetic, and that it is a valuable addition to the various efforts made to represent graphically to the eye the comparative values of different simple fractions. By means of this attractive, brightly-coloured chart, it is asserted that the task is rendered much easier and more pleasant. The bars are all the same size, and by using similar colours it is seen that halves, fourths, sixths, eighths, tenths, and twelfths are relations; that three-sixths equal half, or five-tenths, or six-twelfths. In the same way thirds, sixths, ninths, and twelfths are shown to be akin to each other; so are fifths and tenths; while sevenths and elevenths and unity have colours to themselves. The chart is  $30 \times 21\frac{1}{2}$  inches, is well mounted and varnished, and is distinct enough to be seen across a large schoolroom. The following is a reduced copy of it:—

\* Published by *Sisson & Parker*.



**Cowham's Fractions at a Glance.**—This is a chart or diagram designed to make the rules of fractions both intelligible and interesting in a simple and effective manner. Special features are claimed for it, which are thus enumerated:—

1. A clear notion of the meaning of a "fraction" is given.
2. By moving the T square along the chart all the rules of fractions can be explained.
3. Much valuable knowledge is obtained by simple inspection of the chart by the scholars.

4. Full directions for use are printed on each chart.
5. The reasons for the rules of fractions may be illustrated and understood. The chart can be used for teaching the meaning of numerator and denominator, the comparison of fractions, the measuring of the common denominator of any series of fractions, addition, subtraction, multiplication,

A						B	
1 <sup>1</sup> / <sub>8</sub>	2 <sup>2</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	4 <sup>4</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	6 <sup>6</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	8 <sup>8</sup> / <sub>8</sub>
1 <sup>1</sup> / <sub>6</sub>	2 <sup>2</sup> / <sub>6</sub>	3 <sup>3</sup> / <sub>6</sub>	4 <sup>4</sup> / <sub>6</sub>	5 <sup>5</sup> / <sub>6</sub>	6 <sup>6</sup> / <sub>6</sub>	7 <sup>7</sup> / <sub>6</sub>	8 <sup>8</sup> / <sub>6</sub>
1 <sup>1</sup> / <sub>4</sub>	2 <sup>2</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	4 <sup>4</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>4</sub>	6 <sup>6</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>4</sub>	8 <sup>8</sup> / <sub>4</sub>
1 <sup>1</sup> / <sub>3</sub>	2 <sup>2</sup> / <sub>3</sub>	3 <sup>3</sup> / <sub>3</sub>	4 <sup>4</sup> / <sub>3</sub>	5 <sup>5</sup> / <sub>3</sub>	6 <sup>6</sup> / <sub>3</sub>	7 <sup>7</sup> / <sub>3</sub>	8 <sup>8</sup> / <sub>3</sub>
1 <sup>1</sup> / <sub>2</sub>	2 <sup>2</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>2</sub>	4 <sup>4</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>2</sub>	6 <sup>6</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>2</sub>	8 <sup>8</sup> / <sub>2</sub>
						C	

tion, division, the difference between a vulgar and a decimal fraction, and the reduction of a vulgar to a decimal fraction. As a specimen of the way to use the chart an example in multiplication is chosen, *viz.*,  $\frac{1}{4} \times \frac{1}{2}$ .

The edge of the T square lies against  $\frac{1}{4}$ . By looking along the fourth slip you cannot see what the half of  $\frac{1}{4}$  is, but  $\frac{1}{8}$  is seen to coincide with  $\frac{1}{4}$ , and the  $\frac{1}{2}$  of  $\frac{1}{8}$  may be read off ( $\frac{1}{16}$ ).

### CANCELLING.

In teaching cancelling commence with the recapitulation of the following rule: *If we multiply the numerator and denominator of a simple fraction by the same number the value of the fraction is unaltered, e.g. —*

$$\frac{1}{2} = \frac{1}{2} \times \frac{2}{2} = \frac{2}{4}; \text{ again } \frac{1}{2} = \frac{1}{2} \times \frac{4}{4} = \frac{4}{8}.$$

The converse of this rule is also true. *If we divide the numerator and denominator of a fraction by the same quantity, supposing both to be divisible by that quantity, the value of the fraction is unaltered, e.g. —*

$$\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}, \text{ i.e., } \frac{4}{8} \text{ is equal to } \frac{1}{2}.$$

Illustrate by diagram.

$$\begin{aligned} ABCD &= \frac{3}{10} \text{ of } AEFB, \\ &= \frac{2}{10} \text{ of } AEFB, \\ &= \frac{1}{5} \text{ of } AEFB, \end{aligned}$$

$$\therefore \frac{3}{10} = \frac{2}{10} = \frac{1}{5}; \text{ i.e., } \frac{3}{10} \times \frac{3}{3} \times \frac{1}{3} = \frac{2}{10} \times \frac{1}{1} = \frac{1}{5}.$$

Cancelling out the 2's and 3's in the first fraction, and the 2's in the second we have  $\frac{1}{5} = \frac{1}{5} = \frac{1}{5}$ .

### PRACTICE.

**I. Name.**—Make the class understand the reason for the name. It is so called because it is the *practice* of people in business to make their calculations by this way rather than by multiplication.

**II. Method of Work.**—The calculations are done by the addition of aliquot parts (*i.e.*, fractional parts). The value of a unit of one denomination is always given.

The teacher must explain aliquot (how many), and drill well in aliquot parts before any attempt is made to deal with examples. At first it will be best to confine the attention to the aliquot parts of the *money tables*, because the children will be more familiar with them.

**III. Kinds.**—There are two kinds, simple and compound.

**1. Simple.**—The given number is expressed in the same denomination as the unit whose value is given; *e.g.*, 220 articles at 15s. 6½d. each article. The unit whose value is given is one article, and the number is expressed in articles (220). The class should name what the unit is, and then decompose the 15s. 6½d. into 10s. + 5s. + 6d. + ½d. Then the

Cost of 220 articles at 10s. each = ½ the cost at £1 each = £110 0 0

“ 5s. “ = ¼ “ 10s. “ = 55 0 0

“ 6d. “ = ⅙ “ 5s. “ = 5 10 0

“ ½d. “ = ⅓ “ 6d. “ = 0 9 2

∴ “ 15s. 6½d. “ = £170 19 2

The class should notice that aliquot or fractional parts were found for 10s., 5s., 6d., and ½d., and that these results were *added* together. The work might then be set out in the *ordinary form* and *compared* step by step with the *aliquot* work just done.

	£220 0 0 = cost at £1 each.
10s. = ½ of £1 =	110 0 0 = “ 10s. “
5s. = ¼ of 10s. =	55 0 0 = “ 5s. “
6d. = ⅙ of 5s. =	5 10 0 = “ 6d. “
½d. = ⅓ of 6d. =	0 9 2 = “ ½d. “
	<u>£170 19 2</u> <u>15s. 6½d.</u>

A						B					
1	2	3	4	5	6	C					
7	8	9	10	11	12						
13	14	15	16	17	18						
19	20	21	22	23	24						
25	26	27	28	29	30						
E						F					

The work should next be compared with multiplication, and shown to be shorter as a rule. Several examples should be worked on the B.B. by both methods so as to reveal the fact to the class; *e.g.*, work the following example on the B.B. by both methods, and the truth will be at once apparent: 456 articles at £2 10s. each.

**2. Compound.**— Here we find the value of a compound quantity when the value of a unit of *one* denomination is given; *e.g.*, rent of 15 ac. 3 ro. 36 po. at £9 4s. 6d. per acre.

Now the aliquot parts will be

either 2 rds. = $\frac{1}{2}$ ac.	or 2 rds. = $\frac{1}{2}$ of an ac.
1 rd. = $\frac{1}{2}$ of 2 rds.	1 rd. = $\frac{1}{2}$ of 2 rds.
20 pls. = $\frac{1}{2}$ of a rd.	20 pls. = $\frac{1}{2}$ of a rd.
10 pls. = $\frac{1}{2}$ of 20 pls.	8 pls. = $\frac{1}{6}$ of a rd.
5 pls. = $\frac{1}{2}$ of 10 pls.	8 pls. = $\frac{1}{3}$ of a rd.
1 pl. = $\frac{1}{6}$ of 5 pls.	

From a study of these lead the class to notice that aliquot parts can often be taken in more ways than one. With experience the pupils learn to select the most suitable.

When the unit whose value is given is not that of the highest denomination, it is best to alter either the price or the form of the quantity that it may be so; *e.g.*, 2 tons 4 cwt. 3 qrs. 25 lbs. @ 23s. per cwt. This can be done in several ways:—

- By reducing the denomination of the weight or quantity, *i.e.*, by expressing it as 41 cwt. 3 qrs. 25 lbs.
- By expressing the price as £23 per ton, because if it be 23s. per cwt. it will be £23 per ton.
- And we may find the value at 23s. per ton, and multiply the answer by 20.

Work the example on the B.B. by all three methods and compare them.

## RATIO.

### Truths and Examples.

#### I. Introduction.

#### II. Develop the Idea of Ratio.

##### 1. By Money.

- $\frac{1}{2}d.$  is the half of 1d.
- 1s. is the  $\frac{2}{3}$  of £1.
- 5s. is  $\frac{1}{4}$  of £1.
- 1d. is  $\frac{1}{12}$  of 1s.

##### 2. By Diagram.

#### III. Methods of Expressing Ratio.

- By fractions, as  $\frac{3}{9}$ .
- By words, as 3 is to 9.
- By symbols, as 3 : 9 (units),  
or as 1 : 3 (area).

#### IV. Its Characteristics.

- It points out the relation between the numerator and the denominator of a fraction.

### Teaching.

I. Question on the aliquot parts in practice, and upon the relation of the numerator to the denominator in fractions.

II. 1. Elicit by questioning. By further questioning obtain that

- 1d. is twice as much as  $\frac{1}{2}d.$
- £1 is twenty times as much as 1s.
- £1 is four times as much as 5s.
- 1s. is twelve times as much as 1d.

2. Draw 2 rectangles on the B.B., and let one be 3 times the area of the other. Show the difference by measurement before the class. Divide the rectangles into equal units. Then the class will observe that B

A.	1
	2
	3

B.	1	2	3
	4	5	6
	7	8	9

is 3 times the size of A; or that A is  $\frac{1}{3}$  the

## RATIO—continued.

Truths and Examples.	Teaching.
2. It points out relative sizes or magnitudes.	size of B; or that $\frac{A}{B} = \frac{1}{3}$ ; or A has 3 squares
3. It only compares quantities of the same kind.	and B 9; i.e., $\frac{A}{B} = \frac{3}{9}$ .
<b>V. Definition.</b>	III. Show the class these methods on the B.B., and let them test their knowledge by expressing the ratio in II., 1. The class should notice that ratio is found by dividing and not subtracting.
Ratio is the relation which one quantity bears to another of the same kind with respect to magnitude.	IV. 1. Illustrate by reference to III., 1. 2. Illustrate by reference to the diagrams. 3. Deduce by questioning. Ask class to compare 3 boots and 1 houses, 7 marbles and 3 elephants, etc.
<b>VI. Truths of Ratio.</b>	The third characteristic will then be obvious to the children.
1. Antecedent	V. The class should now be prepared to give the definitions of ratio, which should be written on the B.B. and learnt. They should then be asked to give a number of ratios, expressing them in three different ways. This will test the accuracy of their knowledge, e.g.:
2. Consequent = $\frac{3}{9} = \frac{1}{3}$ .	$\frac{5}{3}$ , or 2 is to 3, or 2:3 $\frac{4}{5}$ , or 4 is to 5, or 4:5, etc.
3. Antecedent = $\frac{3}{1} = 3$ .	VI. Give the names Antecedent and Consequent, with their meanings.
4. Ratio = $\frac{\text{Antecedent}}{\text{Consequent}}$	Demonstrate these truths on the B.B. by the application of some of the ratios given by the class.
5. Consequent = $\frac{\text{Antecedent}}{\text{Ratio}}$	Lead the class to discover that when any two of the three terms are given or known, the other can always be found.
6. Antecedent = Ratio $\times$ Consequent.	Recapitulate.

## PROPORTION.

Truths and Examples.	Teaching.
<b>I. Introduction.</b>	I. Recapitulate rapidly the chief points and truths of the lesson on ratio.
<b>II. Develop the Idea of Proportion.</b>	II. Demonstrate the equality of ratios on the B.B.
5 : 10      15 : 30	Therefore the ratio of $\frac{5}{10}$ is equal to the ratio of $\frac{15}{30}$ ; i.e., there is an equality of ratios. Illustrate and confirm with the other examples.
7 : 21      3 : 9	III. Show this upon the B.B., and call attention to the final form.
8 : 40      20 : 100	The teacher should then give a number of equal ratios, and the class should express them in the form of a proportion. The class should afterwards supply their own examples.
<b>III. Methods of Expression.</b>	IV. The pupils should now be able to give this definition. If they fail the work must be repeated with further explanation.
5 : 10 as 15 : 30 or $\frac{5}{10} = \frac{15}{30}$	V. 1. First give the technicalities and
7 : 21 as 3 : 9 or $\frac{7}{21} = \frac{3}{9}$	
8 : 40 as 20 : 100 or $\frac{8}{40} = \frac{20}{100}$	
or 5 : 10 :: 15 : 30.	
<b>IV. Definition.</b>	
Proportion is an equality of ratios.	
<b>V. Truths of Proportion.</b>	
1. Technicalities.	
The two end terms are called the	

## PROPORTION—continued.

Truths and Examples.	Teaching.
<p>extremes, and the two inner terms the means; <i>e.g.</i> :—</p> <p>Extreme : Mean : Mean : Extreme, or 5 : 10 :: 15 : 30.</p>	<p>illustrate as opposite on the B.B. Elicit by questions that the terms are named from their position.</p>
<p><b>2. Truths.</b></p>	<p>2 and 3. These truths should not be told, but discovered by the use of the B.B. First the proportion should be again stated as in V. 1. on the B.B. Then the illustrations should be taken <i>seriatim</i>, and the result should come as a surprise to the class; <i>e.g.</i> :</p>
<p>(a) Either extreme = <math>\frac{\text{product of means}}{\text{other extreme}}</math>.</p> <p>(b) Either mean = <math>\frac{\text{product of extremes}}{\text{other mean}}</math>.</p>	<p>10 (mean) <math>\times</math> 15 (mean) 5 (extreme) = 30 (extreme) = 5.</p>
<p><b>3. Illustrations.</b></p>	<p>The other cases should be dealt with on the B.B. in a similar way. The figures could then be rubbed out, the terms left standing, and the truths will stand revealed to the class, who should now be asked to reproduce them with illustrations on their slates from memory.</p>
<p>(a) <math>5 = \frac{10 \times 15}{30}</math>      <math>30 = \frac{10 \times 15}{5}</math></p> <p>(b) <math>10 = \frac{5 \times 30}{15}</math>      <math>15 = \frac{5 \times 30}{10}</math></p>	<p>VI. The class will be able to do this from what they know of the truths of proportion. Point out that 3 terms are given, and that it is required to find the 4th. Ask the class to express the ratios.</p>
<p><b>VI. Applications of its Truths to the Rule of Three.</b></p>	<p>First ratio <math>\frac{4 \text{ books}}{100 \text{ books}} = \frac{24s.}{\text{Req. No. of Sh.}}</math></p>
<p>Problem: Given any 3 of the 4 terms of a proportion, to find the 4th.</p>	<p>second ratio. Or 4 books : 100 books :: 24s. : Req. No. of S.</p>
<p><b>Example.</b></p>	<p>Apply V. 2, and we get—</p>
<p>If 4 books cost 24s. what will 100 books cost at the same price?</p>	<p>Either extreme = <math>\frac{\text{product of means}}{\text{other extreme}}</math></p>
<p>Reqd. cost = <math>\frac{24 \times 100}{4} = 600 \text{ sh.}</math></p>	<p>then req. No. of s. (one extreme) = <math>\frac{100 (\text{mean}) \times 24 (\text{mean})}{4 (\text{other extreme})}</math></p>
<p>The complete proportion becomes—</p>	<p><i>i.e.</i>, req. No. of s. = <math>\frac{100 \times 24}{4} = 600s.</math></p>
<p>4 books : 100 books :: 24s. : 600s.</p>	<p><i>i.e.</i>, <math>\frac{4 \text{ books}}{100 \text{ books}} = \frac{24s.}{600s.}</math> or 4 : 100 :: 24 : 600.</p>
<p><b>Other Examples.</b></p>	
<p>A few other examples should be written here, some of which should be given by the teacher, and some by the class.</p>	

**The Unitary Method of Proportion.**—The process here is much more simple and requires no explanation of ratio or proportion. We seek to find what is wanted from what is given by *passing through a unit common to both*; *e.g.*, If 6 books cost 12s., what will 9 books cost at the same price?

Given that 6 books cost 12s.,  
Then 1 book (*common unit*) costs  $\frac{12}{6} = 2s.$ ,  
 $\therefore$  9 books cost  $9 \times 2 = 18s.$

### Advantages and Disadvantages of the Two Methods.

#### 1. The Proportion Method.

- (a) It takes up and expands an Arithmetic principle which the children have already recognised in Practice and Fractions.

- (b) It offers a fine exercise for training the reasoning faculty.
1. By demanding that they shall see the relationship existing between terms when differently grouped.
  2. By requiring them to formulate the truths expressed; e.g., the product of the extremes is equal to the product of the means.
- (c) It leads to guessing, and has a tendency to become purely mechanical, the truths embodied in it either being forgotten, or never properly understood.
- (d) It requires more time than the other method.

## 2. The Unitary Method.

- (a) Its great recommendation is its simplicity of principle.
- (b) It dispenses with the necessity for distinguishing between Simple and Compound Proportion.
- (c) It is generally a safer method than the other, for the terms, especially in Compound Proportion, are often misstated.
- (d) There is more intelligence accompanying its work, for its truths are easily grasped and remembered; and it does not so readily become mechanical.
- (e) Generally it is more expeditious.
- (f) It is usually the method preferred by examiners.

## DECIMALS.

**1. Notation and Numeration.**—In teaching the notation of decimals, comparison should be made with the ordinary system of notation. So far as the whole numbers are concerned, the systems will be seen to be alike; the difference presents itself with the introduction of the decimal fractions.

In the ordinary system of notation any figure in the units place retains its *intrinsic* value, whilst every figure to the left of the units place acquires a *local* value; i.e., a value dependent on its position. This value becomes *ten times greater for every place it is moved to the left*. Our ordinary system of notation is thus seen to have 10 for its basis. The teacher's work now is to show that the value of every digit in a system of decimal fractions becomes *ten times less for every place it is moved to the right*. This should be illustrated on the 3.13. by suitable examples, and the type of example lending itself most readily to a lucid explanation is one composed entirely of the same digits; e.g.,

4 4 4 4 ' 4 4 4 4.

Decomposing this number we have—

$$\begin{array}{lcl}
 4000 + 400 + 40 + 4 + '04 + '004 + '0004. \\
 \text{i.e., } 4000 = 4 \times 1000 & \left| & '4 = 4 \times \frac{1}{10} = \frac{4}{10} \\
 400 = 4 \times 100 & \left| & '04 = 4 \times \frac{1}{100} = \frac{4}{100} \\
 40 = 4 \times 10 & \left| & '004 = 4 \times \frac{1}{1000} = \frac{4}{1000} \\
 4 = 4 \times 1 & \left| & '0004 = 4 \times \frac{1}{10000} = \frac{4}{10000}
 \end{array}$$

The teacher should now *tell* the class the respective names of the two portions constituting the decimal quantity. From this illustration it will

be seen that the numbers to the left of the decimal point are called *integral* (whole numbers), and the part to the right of the point *decimal* (fractions). The class should now be able to see that a *decimal fraction is one whose unexpressed denominator is either ten or some power of ten*. Plenty of other examples should be given.

## 2. Decimals, Finite and Infinite.

(a) **To Convert a Decimal to a Vulgar Fraction.**—Before dealing with finite or infinite, or as they are sometimes called terminating and non-terminating decimals, it will be necessary to show the class how to convert a decimal to a vulgar fraction.



Take  $69.426$  as an example.

$$\begin{aligned} 69.426 &= 69 + \frac{4}{10} + \frac{2}{100} + \frac{6}{1000} \\ &= 69 + \frac{426}{1000} = 69\frac{426}{1000} = \frac{69426}{1000}. \end{aligned}$$

After this and other examples have been worked and explained upon the B.B., the class might then be asked to state the rule:—

*Write down the given number, omitting the decimal point, for the numerator, and for the denominator write unity (1) followed by as many cyphers as there are decimal places in the given number. If there be no integral portion apply the rule to the decimal portion only, and reduce to its lowest terms; e.g.—*

Reduce  $.0685$  to a vulgar fraction.

$$.0685 = \frac{6}{1000} + \frac{8}{10000} + \frac{5}{100000} = \frac{685}{100000} = \frac{137}{20000}.$$

The reverse process should then be shown, *i.e.*, to convert a vulgar fraction to a decimal, and the two processes should be compared.

(b) **Terminating and Non-terminating Decimals.**—Work a series of examples on the B.B., and let the class discover this for themselves. They will then find that it is not possible to express every vulgar fraction as a decimal. They will discover that a vulgar fraction must have 10 or some power or factor of 10 for its denominator before it can be exactly expressed by a decimal.

Take as examples  $\frac{1}{10}, \frac{3}{11}, \frac{4}{7}, \frac{15}{25}, \frac{8}{9}, \frac{6}{16}$ .

$$\begin{array}{ll} \frac{1}{10} = .1 & \frac{3}{11} = .272727 \dots \\ \frac{15}{25} = \frac{3}{5} = .6 & \frac{4}{7} = .571428571428 \dots \\ \frac{8}{9} = .88888 \dots & \frac{6}{16} = .375 \end{array}$$

Those to the left terminate; those to the right do not. Now ask the class to examine the denominators of all these fractions, by reducing them to their prime factors.

$$\begin{array}{ll} 10 = 5 \times 2 & 11 \text{ is a prime number} \\ 5 = 5 \times 1 & 7 \quad \text{''} \quad \text{''} \\ 16 = 2 \times 2 \times 2 \times 2 & 9 = 3 \times 3 \end{array}$$

It will be observed that the denominators of all the fractions which give terminating decimals contain the factors 2 or 5 or both, and these are the factors of 10. The denominators of the fractions which give non-terminating decimals contain other factors than 2 or 5; hence the rule:—

*If the denominator of the given vulgar fraction in its lowest terms be a multiple of the factors 2 or 5 only, the fraction can be expressed as an exact or terminating decimal; otherwise it cannot.*

But though a given vulgar fraction may not be exactly expressed as a decimal, nevertheless we can express it to any degree of accuracy we please short of absolute accuracy. The accuracy may be so great as to be sufficient for all practical purposes; *i.e.*, it may be *practically accurate*, although *theoretically inaccurate*.

Take  $\frac{1}{3}$  as an example.

$$\begin{array}{llll} \frac{1}{3} \text{ is greater than } .8 & \text{but less than } .9; & \text{error less than } \frac{1}{30}. \\ \text{''} & .88 & \text{''} & .9; & \text{''} & \frac{1}{300}. \\ \text{''} & .888 & \text{''} & .9; & \text{''} & \frac{1}{3000}. \\ \text{''} & .8888 & \text{''} & .9; & \text{''} & \frac{1}{30000}. \end{array}$$

The error is thus seen to grow less and less, and by taking a proper number of figures in the decimal part,  $\frac{1}{3}$  can be thus represented to any required degree of accuracy.

**To Determine the Limit of the Number of Repeating Figures in a Non-terminating Decimal.**—Take  $\frac{1}{7}$  as an example to illustrate this.

The divisor is 7, and it will be observed that the number of figures recurring is 6, which is the limit, or greatest number possible for this

Reduce  $\frac{7}{7}$  to a decimal

$$\begin{array}{r} 7 \overline{)600000} \\ \underline{857142} \dots \end{array}$$

divisor, for since every remainder must be less than the divisor the only possible remainders are 6, 5, 4, 3, 2, 1, and 0. But the cypher cannot be a remainder, else the decimal would not recur. There are,

therefore, only 6 remainders possible, and, therefore, there cannot be more than 6 figures - there may be less in the recurring period.

The teacher should give other examples to show that the recurring figures are not necessarily always one less in number than the divisor, e.g.,  $\frac{8}{9} = .\dot{8}$ . Here the recurring figure is one only; with  $\frac{1}{11}$ , which =  $.2\dot{7}$ , the recurring figures are two; but in any case they can never be more than one less than the divisor.

**To Change a Pure Circulating Decimal into a Vulgar Fraction.**—The method is as follows:—

Change  $.7\dot{0}1$  to a vulgar fraction.

$$1. \quad .7\dot{0}1 \times 1000 = 701.\dot{7}01 = 701 + .7\dot{0}1.$$

Why multiply by 1000? Because there are 3 decimal places, and the object is to convert them into whole numbers (integers). Let the class note that 1000 gives 3 cyphers for 3 decimal places.

1000    "    4    "    "    4    "    "    and so on.

2. Now take  $.7\dot{0}1$  from each side and we get

$$.7\dot{0}1 \times 999 = 701.$$

3. Next divide each side by 999, and we then get  $.7\dot{0}1 = \frac{701}{999}$ .

4. The class should then state the rule:—

*The numerator of the vulgar fraction is the number formed by the digits in the recurring period; the denominator is the number formed by repeating the digit 9 as many times as there are digits in the circulating period.*

**To Convert an Impure Circulator into a Vulgar Fraction.**

Convert  $.459\dot{0}6$  into a vulgar fraction.

$$.459\dot{0}6 \times 100000 = 45906.906906, \text{ etc.}$$

$$.459\dot{0}6 \times 100 = 45.906906, \text{ etc.}$$

$$.459\dot{0}6 \times 99900 = 45861.$$

$$\begin{array}{r} .459\dot{0}6 \\ \underline{99900} \end{array}$$

There are four steps.

1. Multiply by 100000 to convert  $.459\dot{0}6$  into whole numbers.

2. Multiply  $.459\dot{0}6$  by 100 to convert the non-recurrs into whole numbers.

3. Then subtract both sides.

4. Then divide each side by 99900.

The pupils should then be able to give the rule:—

*The numerator is formed by subtracting the non-recurrs from the whole quantity; the denominator is formed by writing 9 for every figure that recurs and a cypher for every figure that does not recur.*

**The Simple Rules.**—It is not anticipated that the young teacher will now find any difficulty in explaining intelligently the simple rules of decimals to a class, especially in the case of addi-

tion and subtraction. Multiplication should be handled with equal ease, and in all three cases the proofs should be given by vulgar fractions. There are now a number of good arithmetics in the market, and any one of these will probably give all the assistance that may be required for the efficient teaching of these rules. A little more difficulty may be felt in the case of division; but even here the rule, however stated, always depends upon the same principle as that of ordinary simple division. The only difficulty is in fixing the position of the decimal point in the quotient; but whatever method of working is adopted, the teacher should make the class thoroughly grasp the fact that *there must always be as many decimal places in the divisor and quotient together as there are in the dividend alone.*

**Applications of Proportion.**—Many of the higher rules of arithmetic are really applications of proportion, and this is especially true of interest, percentages, averages, and stocks. A number of technical terms are of necessity introduced; but the principle of the work is more or less the same in all of them. These technicalities must be carefully introduced, well explained, and freely illustrated by commercial examples. No attempts should be made to “draw” or “educe” these terms. They are matters for instruction, rather than training. The solving of the examples themselves will afford plenty of opportunity for the educative side of the work, and the teacher will find his best results there. There is little difficulty in giving clear conceptions of such terms as interest, discount, amount, principal, rate (*i.e.*, rate per cent. per annum, unless otherwise stated), commission, brokerage, etc.; but there is always more difficulty in dealing with stocks, and the teacher must be prepared to devote plenty of time to this subject. This difficulty arises partly from the magnitude, or breadth rather, of the applications of stocks. The stock may be government stock, as distinct from commercial or business stock. To solve all cases dealing with government stock, a full and proper knowledge of bonds, the national debt, the public funds, annuities, loans, consols and such jargon as the 3 per cents, the 4 per cents, etc., is required. Then the capital of public companies like our great banks, chartered companies, railways, gas, mines, shipping, etc., which issue stock or raise their funds by the sale of stock requires some explanation. These are generally offered in shares, and are generally bought and sold through the agency of stockbrokers, who require a commission which they call brokerage. The stock may be at par, at a dis-

count, or at a premium, and so on. It will thus be seen that the child has to practically acquire a special vocabulary to understand the very terms in which his arithmetic problems are couched, before he can deal with the difficulties of the actual problems themselves. These names are often mere abstractions to the children for a time, and in the early stages it is advisable to substitute the names of concrete objects where possible to aid them to a clear conception of the process.

**Some Principles in the Teaching of Arithmetic.**—The first notions should be derived from the observation and handling of material objects. The teaching should deal only with practical numbers, locally coloured and within the limits of child capacity and experience. The teaching need not be confined to integers; elementary ideas of fractions may be given almost from the first. The teaching should be graded, proceeding through the lower numbers to the higher ones, and treating each thoroughly in all its variations before proceeding to the next. The work should be done through the senses, so that all truths or definitions may be discovered; *e.g.*, that  $2 + 3 = 5$  should be discovered; not told. The teaching should recognise the child's love of activity, and for this reason the sticks, cubes, or other suitable articles should be handled, counted and manipulated by the child himself. When mistakes are made the child would then be able to correct his own errors, and find the correct answers. A mistake should never be passed over, and the child should be set to repeat the particular operation until it is performed correctly.

But it must be remembered that there is little learning without repetition; hence it will be necessary to repeat the various operations at different times, or at the same time by varying the objects used. The repetition will then be intelligent and will stand an improved chance of dwelling in the memory. This will be especially noticeable in the learning of the various tables, where names, often strange to the child, correspond to no facts of his experience. For this reason, even at later stages, common tables only should be acquired. For the lowest class it would be sufficient to confine this branch of the work to the parts of a shilling, the number of days in a week, to the foot and the yard. The work should still be concrete, where possible, the coins being seen and the lengths being measured. All the requisite tables should be learned in this practical manner and the knowledge thus acquired should be applied at once to carefully chosen practical examples.

The transition from the concrete to the abstract should be made also by carefully graded steps, and for this purpose, as has been pointed out already in this chapter, the objects should be varied; for simple abstract ideas are obtained only by the comparison of different things. For instance, the children might count 2 bricks and 3 bricks and give the total; the bricks might then be removed and the calculation made again in terms of bricks; the process might then be repeated with other objects, *e.g.*, 2 cubes and 3 cubes, etc.; the numerical idea might then be strengthened by measuring 2 feet and 3 feet on the desk, the total still being asked for; the semi-final step might be the total of 2 things and 3 things and the abstract calculation  $3 + 2$  would be the final step. The answers should always be given, at first, at least, in complete sentences, and whatever articles are being utilised in the calculation should be named in the answer. All lessons should be short and simple.

The above scheme of teaching is practically that recommended by the Education Department of Adelaide, S. Australia. In any lesson on a particular number, *e.g.*, the number 4, the ball frame would be used, the balls being separated a little so that they could be easily counted. The steps in the lesson then would comprise:—

**1. Composition**, counting and addition of the number, *e.g.*,  $1 + 1 + 1 + 1$ ;  $2 + 1 + 1$ ;  $3 + 1$ ;  $2 + 2$ . The counting is done forwards and backwards.

**2. Subtraction**, *e.g.*,  $4 - 1$ ;  $4 - 2$ ;  $4 - 3$ ;  $4 - 4$ .

**3. Multiplication**, *e.g.*, one ball placed on each of 4 wires. Balls counted. How many times did I put out one ball? Then 4 times 1 ball will be 4; similarly  $2 \times 2 = 4$ .

**4. Division**, *e.g.*,  $4 \div 4$ ;  $4 \div 2$ ;  $4 \div 1$ ;  $2 \div 2$ ;  $2 \div 1$ .

**5. Fractions**, *e.g.*, 2 is  $\frac{1}{2}$  of 4; 1 is  $\frac{1}{4}$  of 4; 3 is  $\frac{3}{4}$  of 4.

**6. Comparison**, *e.g.*,  $4 > 3$ ;  $3 > 2$ ;  $2 > 1$ ;  $1 > 0$ ;  $3 < 4$ ;  $2 < 3$ , etc.

**7. Completion**, 3 want 1 to make 4; 2 want 2; 1 wants 3.

**8. Applied Questions.** These are of the usual type, dealing with common objects; *e.g.*, John has two apples, Mary 1; how many together.

**MENTAL ARITHMETIC.****I. Objects of Mental Arithmetic.**

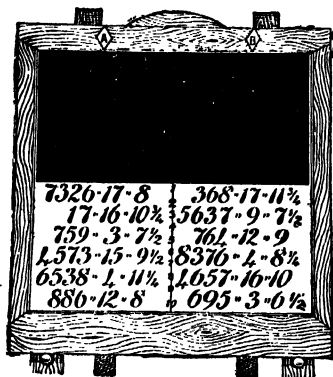
1. To ensure **rapidity** and **accuracy** in arithmetic.
2. To develop **dexterity** in the manipulation of quantities.
3. To **train the mind** for the arithmetic of the next standard.
4. To **recapitulate** rapidly and frequently the work of the lower standards.
5. To form the **habit** of mental activity.

**II. How to obtain these Objects.**

1. Do not confine your questions to "scores" and "dozens," but give plenty of "tots" embracing practice in all the ordinary processes of arithmetic.
2. Let your examples be **varied**.
3. Let them deal both with the **abstract** and the **concrete**.
4. Give exercises in the **fractional parts** of money, and the commonest weights and measures.
5. Let the questions be **practical**. The dimensions of the schoolroom, the playground, and the desks. The weights of a few familiar objects should be accurately known and recorded, and occasionally referred to as standards of measurement.

**III. Tots.**—A footnote to Schedule I. in the Code requires the inspector to demand of scholars of the Fourth Standard and upwards the addition of columns of pounds, shillings, and pence within a specified time, in order to show readiness and accuracy. "Occasionally a long column of figures may be written in the sight of the scholars, and they may be required to name in quick succession the results of each addition as the inspector or teacher points to the several figures in any order. Oral practice should be given in all the ordinary processes of arithmetic, and it should be so varied as to furnish as many different forms of exercise as possible." It will thus be seen that a great deal of importance is attached to practice in such calculations as are now known as "tots," and for this purpose, where possible, it is best to use a *tot frame*. Where the teacher has to write every "tot," a large amount of time is unnecessarily expended; and so far as such things lie in the teacher's power, efforts should be made to avoid this. Nor should these exercises be postponed till the Fourth Standard; they should begin in the First, and might find a place in the higher classes of the infant school. The nature of the

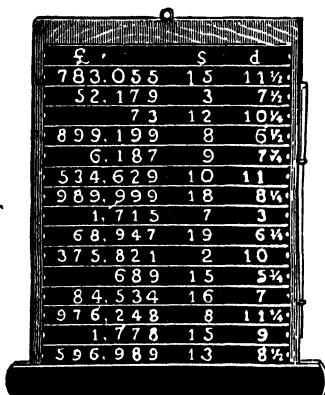
"tot" can be suited to the capacity and requirements of the children. Tot cards are published and may be used, but the tot frame is undoubtedly the best aid for this work.



**1. Arnold's Revolving Tots.**—This piece of apparatus consists of a revolving sheet of figures, which can be covered so far as is desired by a revolving curtain. Both sheet and curtain are worked by screws at the top right-hand corner of the frame. It is obvious that an immense variety of examples can be supplied by the proper regulation of the sheet and curtain, and that that ready practice desired can easily be obtained. The immense variety of combinations possible prevents the tots ever becoming "known," so that every fresh adjustment will always demand a fresh calculation.

**2. The Oxford Tot Frame.**—This tot frame is also specially suited to the requirements of the new Code. It consists of 16 reversible tablets, with figures on either side. The tablets are reversed very easily and very quickly, so that an infinite variety of examples can be supplied. The figures are painted white, and are  $1\frac{1}{2}$  inches in size, so that it is suitable for work with large classes. It is specially designed to rest on any easel, and it contains a very good feature in its B.B. space at the bottom for the answer.

Provision is also made at the side for the keeping of a pointer, so that it is always ready to hand. A simpler frame is provided for younger classes, and a double frame for classes working in two sections. Answers may be obtained from the firm selling these for this frame, but not for the simpler one. The tots can be lengthened or shortened by simply pointing to their limit, 4, 5, 6, or 7 rows, as the case may be, and variety is obtained by reversing one or more tablets.



#### IV. Some Special Rules for Mental Arithmetic.

##### 1. So much a Day, how much a Year.

(a) Learn following table:—

1d. per day = £				per year.			
$\frac{1}{4}$ d.	"	=	1	2	9	$\frac{1}{2}$	"
$\frac{1}{2}$ d.	"	=	0	15	2	$\frac{1}{2}$	"
$\frac{3}{4}$ d.	"	=	0	7	7	$\frac{1}{2}$	"

(b) Multiply the shillings and pence per day by 5, add 7s. 7½d. for every farthing, and then for every penny reckon £1½; e.g., 6s. 4½d. a day, how much a year

$$\begin{array}{rcl}
 \text{1. Add } 15\text{s. } 2\frac{1}{2}\text{d. for the } \frac{1}{2}\text{d. per day} & = & \begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ 0 \quad 15 \quad 2\frac{1}{2} \end{array} \\
 \text{2. Multiply } 6\text{s. } 4\text{d. by } 5 & = & \begin{array}{r} 1 \quad 11 \quad 8 \end{array} \\
 \text{3. Add } \text{£}1\frac{1}{2} \text{ for every penny (76d.)} & = & \begin{array}{r} 114 \quad 0 \quad 0 \end{array} \\
 \hline
 & & \text{£}116 \quad 6 \quad 10\frac{1}{2}
 \end{array}$$

**2. To reduce cwt.s. qrs. lbs. to lbs.—Rule.** To the number represented by the cwt.s. and lbs. add 12 times the number of cwt.s., and add 28 for every quarter, e.g. :—

Reduce 32 cwt. 2 qrs. 24 lbs. to lbs.

$$\begin{array}{rcl}
 \text{(a) Number represented by cwt.s. and lbs.} & = & 3224 \\
 \text{(b) Add 12 times the number of cwt.s. (12 × 32)} & = & 384 \\
 \text{(c) Add } 2 \times 28 \text{ for 2 qrs.} & = & 56 \\
 \hline
 & = & 3664 \text{ lbs.}
 \end{array}$$

**3. Interest at 5 per cent., e.g., £689 15s. 0d. at 5 per cent.**

$$\begin{array}{rcl}
 \text{(a) Call the pounds shillings and divide by 20} & = & \text{£}34 \quad 9 \quad 0 \\
 \text{(b) 15s. is } \frac{3}{4} \text{ of } \text{£}1 \therefore \text{ call it } \frac{3}{4} \text{ of a shilling} & = & \begin{array}{r} 0 \quad 0 \quad 9 \end{array} \\
 \hline
 & = & \text{£}34 \quad 9 \quad 9
 \end{array}$$

**4. Interest at 2½ per cent.**—Proceed as for 5 per cent., and divide your answer by 2

**5. Interest at 6½ per cent., e.g., £960 16s. 8d. at 6½ per cent.**

Divide the amount by 16, because 6½ is ⅙ of 100.

$$\frac{\text{£}960 \quad 16 \quad 8}{16} = \text{£}60 \quad 1 \quad 0\frac{1}{2}$$

Rates which are easy factors of 100 can be similarly dealt with.

**6. Interest for an Allquot Part of a Year.** This will include such quantities as 73 days, 219 days, etc. Note that the days are generally some easy factor of 365. Proceed as in 5 per cent. or 4 per cent., or the stated percentage, and then divide by the required fraction; e.g. :—

£348 15s. 0d. for 73 days at 5 per cent.

$$\begin{array}{rcl}
 \text{(a) 348 shillings} & = & \text{£}17 \quad 8 \quad 0 \\
 \text{(b) 15s. = } \text{£}\frac{3}{4}; \text{ call it } \frac{3}{4}\text{s.} & = & \begin{array}{r} 0 \quad 0 \quad 9 \end{array} \\
 \hline
 \text{(c) Add two together} & = & \text{£}17 \quad 8 \quad 9 \\
 \hline
 \text{(d) Divide by } \frac{1}{4} \text{ (} \frac{365}{73} \text{)} & = & \text{£}3 \quad 9 \quad 9
 \end{array}$$

**7. To find Interest at any Rate, e.g., £345 15s. 0d. at 4 per cent.** Multiply by double the given rate, point off the last figure in the £'s, and call them shillings (i.e., all except the last figure).

$$\begin{array}{rcl}
 \text{(a) } \text{£}345 \cdot 15\text{s. 0d.} \times 8 & = & \begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ 2766 \quad 0 \quad 0 \end{array} \\
 \text{(b) Point off last figure of 2766 = 276s.} & = & \begin{array}{r} 13 \quad 16 \quad 0 \end{array} \\
 \text{(c) The 6 pointed off is } \frac{6}{100}\text{s., which equals } 7\frac{1}{2}\text{d.} & & \\
 \text{(d) Adding (b), (c) we get } \text{£}13 \quad 16\text{s. 0d.} + 7\frac{1}{2}\text{d.} & = & \text{£}13 \quad 16\text{s. } 7\frac{1}{2}\text{d.}
 \end{array}$$



**8. To find the Mean Proportional, e.g., as  $3 : x :: x : 12$ .** *Rule.* Multiply extremes and take the square root.

$$3 \times 12 = 36$$

$$\sqrt{36} = 6$$

$$\text{Hence } 3 : 6 :: 6 : 12.$$

*Again.* Find the mean proportional of 363 and 243.

(a) Factor the numbers  $3 \times 121$  and  $3 \times 81$ .

(b) Rearrange in squares  $121 \times 81 \times 9$  and multiply.

(c) Take square roots  $11 \times 9 \times 3$ .

(d) Multiply for product 297.

$$\text{Hence } 363 : 297 :: 297 : 243.$$

### 9. Practice.

(a) **Allquot Parts.**

1. 4864 articles at 12s. 6d. = £4864  $\times \frac{5}{8}$  (12s. 6d. being  $\frac{5}{8}$  of £1).

$$\text{For convenience multiply by 2} = \frac{4864 \times 10}{16} = £3040.$$

i.e., Add a cypher and divide by 16.

2. For 2s.  $7\frac{1}{2}d.$ , e.g., 264 articles at 2s.  $7\frac{1}{2}d.$

$$2s. 7\frac{1}{2}d. = 2s. 6d. + 1\frac{1}{2}d.$$

$$2s. 6d. = £\frac{1}{8} \text{ and } 1\frac{1}{2}d. = \frac{1}{8}s.$$

$$\text{Hence } \frac{1}{8} \times £264 = £33 \text{ os. } 0d.$$

$$\text{And } \frac{1}{8} \times 264s. = £1 \text{ } 13s. \text{ } 0d.$$

$$\underline{\underline{£34 \text{ } 13s. \text{ } 0d.}}$$

3. For  $9\frac{3}{4}d.$  Divide the amount or number by 16, and call your answer shillings, then multiply by 13; e.g., 562 articles at  $9\frac{3}{4}d.$

$$\text{Divide by 16} = 562 \div 16 = 35\frac{1}{2}s. = 35s. 1\frac{1}{2}d.$$

$$\text{And } 35s. 1\frac{1}{2}d. \times 13 = 456s. 7\frac{1}{2}d. = £22 \text{ } 16s. 7\frac{1}{2}d.$$

$$\text{Reason for process—} 9\frac{3}{4} = \frac{39}{4} = \frac{16\frac{1}{2}}{2} = \frac{13 \times 1\frac{1}{2}}{2}.$$

(b) **To Multiply by such Amounts as give easy Numerators or Denominators.**

Take £33 6s. 8d.  $\times$  562 as an example.

$$£33 \text{ } 6s. \text{ } 8d. = 33\frac{1}{3} = \frac{100}{3}.$$

$$\therefore £33 \text{ } 6s. \text{ } 8d. \times 562 = \frac{100}{3} \times 562 = \frac{56200}{3} = £18733 \text{ } 6s. \text{ } 8d.$$

**10. Decimals.**—To reduce one amount to the decimal of another, e.g., Reduce 6s. 9d. to the decimal of £4 13s. 9d.

(a) Find the factors of the smaller sum 6s. 9d. = 81d. =  $9 \times 9$ .

(b) Divide the given sum by either of the factors ( $9 \times 9$ ) which is contained in it. (In this case both are.)

$$\text{Then } £4 \text{ } 13s. \text{ } 9d. \div 9 = 10s. \text{ } 5d.$$

(c) Then the fraction becomes  $\frac{9}{10s. \text{ } 5d.} = \frac{9}{18} = .072$ .

It will be observed that a common factor (9) is cancelled out of each quantity, and the remaining factors 9 and 10s. 5d. constitute the fraction which is reduced to a decimal.

### 11. To Square Numbers.

(a) **To Square a Special Number.**—The numbers are just below or just above an exact number of hundreds, like 495 or 906.

$$(495)^2 = (495 + 5)(495 - 5) + 5^2.$$

$$= (500 \times 490) + 25 = 245025.$$

To those who know Algebra the reason for the rule is easily understood.

$$\text{For } x^2 - y^2 = (x + y)(x - y),$$

$$\text{Then } x^2 = (x + y)(x - y) + y^2.$$

Note that such a number is taken as will just raise or reduce the given number to an exact number of hundreds; e.g., 5 is added and subtracted in the first case; whilst 6 is subtracted and added in the second case.

(b) **Having given a Number to find the Square of the next Highest Number.**—This may be otherwise expressed as finding the square of a number just above or just below an exact number of tens; e.g., 41.

$$\text{Decomposing } 41 = (40 + 1),$$

$$\text{And } (41)^2 = (40 + 1)^2 = (40)^2 + 2 \cdot 40 \cdot 1 + 1^2$$

$$= 1600 + 80 + 1$$

$$= 1681$$

$$\text{Reason for rule } (x + 1)^2 = x^2 + 2x + 1$$

$$\text{And } (x - 1)^2 = x^2 - 2x + 1$$

(c) **To Square any Number mentally**, say 36.

1. Add the unit figure to the whole number;  $36 + 6 = 42$ .
2. Multiply the 42 by the tens figure (3);  $42 \times 3 = 126$ .
3. Add a cypher to the right (i.e., multiply by 10); 1260.
4. Add the units figure squared ( $6^2$ );  $1260 + 36 = 1296$ .

**12. To find True Discount.**

- (a) At 5 % divide by 21; for  $\frac{100}{21} = 21$ .
- (b) " 4 % " 26; "  $\frac{100}{4} = 26$ .
- (c) " 10 % " 11; "  $\frac{100}{10} = 11$ .
- (d) "  $2\frac{1}{2}$  % " 41; "  $\frac{100}{2\frac{1}{2}} = 41$ .
- (e) " 1 % " 101; "  $\frac{100}{1} = 101$ , and so on.

**Examples.**

1. £350 7s. 10½d. due in 1 year at 5%.  
Then £350 7s. 10½d. ÷ 21 = £16 13s. 8½d.
2. £433 14s. 3d. due in 1 year at 4%.  
Then £433 14s. 3d. ÷ 26 = £16 13s. 7½d.

**If for a certain Number of Years.**—To find the fraction multiply the time (in years) by the rate. This gives the numerator. For a denominator add the numerator to 100.

Find True Discount on £4120 8s. 7d. due 9 months hence at 4 per cent.

$$\text{Rate} = \frac{4}{100} \times 4 = 3.$$

$$\text{Then the fraction is } \frac{3}{103}.$$

$$\text{And } £4120 \text{ 8s. 7d.} \times \frac{3}{103} = £40 \text{ os. 1d.} \times 3 = £120 \text{ os. 3d.}$$

## V. Typical Problems for each Standard.

### Standard I.

1. How many must be added to 42 to make 72?
2. A man is 6 feet high. How many inches is that?
3. A man spends 6s. in penny stamps. How many does he get?
4. Apples are 6 a penny. How many for a shilling?
5. Of what number is 36 the half?
6. Three 24's are the same as how many 8's?

**Standard II.**

1. A boy has 10s. How much will he have left after spending 6s.  $11\frac{1}{2}d.$ ?
2. How many more tens are there in 130 than in 100?
3. I have 10s. 10d., and give 100 boys 1 penny each; how much money do I keep?
4. How many halfpenny oranges can be bought for 1s.  $1\frac{1}{2}d.$ ?
5. To 50 add 8 six times over.
6. 5 lbs. of bacon at 11d. a lb.

**Standard III.**

1. How many lbs. of butter at 1s. 1d. per lb. can be bought for 26s.?
2. How many more are 11 eights than 7 twelves?
3. A milkman has  $3\frac{1}{2}$  galls. of milk. How many half pints can he sell?
4. How many children could take away 7 each from 63?
5. The circumference of a wheel is 12 feet. How many times will it go round in a mile?
6. Eggs are 10 a shilling. How many for a guinea and a half?
7. A man was born in 1831. How old is he now?
8. 6d. an hour for 8 hours a day. For 6 days, how much?
9. A joint of meat weighs  $9\frac{1}{2}$  lbs. What did it cost at 10d. a lb.?
10. Divisor 25; quotient 8; remainder 6. What is the dividend?

**Standard IV.**

1. Suppose tea at 2s. 8d. a lb. How many oz. could be bought for 10s.?
2. A man steps 2 feet. In how many steps will he walk a furlong and back again?
3. A servant girl gets £13 a year wages. How much is that a week?
4. A man drinks  $\frac{1}{2}$  pint of beer at dinner and  $\frac{1}{2}$  pint at supper. How long would it take him at that rate to empty a 9-gallon cask?
5. 6 telegraph wires extend 5 miles each. What is the wire worth at 1d. per yard?
6. A wall is 20 yds. by 6 feet. What will it cost to whitewash at  $\frac{1}{2}d.$  a square foot?
7. A ton of coals costs 25s. What is that a cwt.?
8. Potatoes are 3 lbs. for 2d. How many lbs. can be bought for 5s.?
9.  $64 \div 29 = 12 \div 9$ .

**Standard V.**

1. How many quarters are there in  $3\frac{1}{2}$  wholes?
2. What part of a sovereign is 8s. 4d.?
3. What number is the same part of 50 as 5 is of 6?
4. I buy tea at 2s. a lb. What would  $\frac{1}{2}$  of  $\frac{3}{4}$  lb. cost?
5. Which is the greater,  $\frac{5}{8}$  of 7 or  $\frac{7}{8}$  of 5?
6. I buy a cart for £20. I want to gain 10 per cent. For what must I sell it?
7. How many men in 10 days will do the same amount of work as 5 men in 15 days?
8. A man owes £150. He becomes bankrupt, and can only pay 2s. 6d. in the £. How much money has he?

**Standards VI. and VII.**

1. How many times is  $\frac{1}{8}$  contained in  $3\frac{1}{2}$ ?
2. S. I. on £350 for 2 years at 5 per cent.
3. Express '05 of  $\frac{3}{4}$  as a vulgar fraction.
4. Reduce 25 threepenny pieces to the fraction of £2.
5. A man pays £800 for a house. The ground rent is £7; the lease is 80 years. What does the house cost him?
6. A man buys a bicycle for £18, and gets 20 per cent. discount for cash. What does he pay for it?
7. A man works on commission at  $3\frac{1}{2}$  per cent. He receives £31 $\frac{1}{2}$ . How much money does he collect?

## EXAMINATION QUESTIONS.

1.—Explain fully, as to a class of beginners, the method of long division, and work out the following question so as to show the meaning and value of each figure in the answer: Divide £23782 10s. 6d. by 17.

2.—Describe the best system you know for teaching numeration and notation.

3.—Make four sums—two in direct and two in inverse proportion—and show how you would explain to a class the working of one of them.

4.—Write out four simple problems in arithmetic, such as would be suitable in the Fourth Standard, for testing the intelligence with which the scholars had learned the rules.

5.—The new Code requires an exercise in rapid addition. Make out a column of figures suited for this exercise, and say how you would best secure quickness and accuracy in performing it.

6.—Show by means of illustrations how you would explain to a class of scholars the reason of one of these processes:—

(a) Finding the common denominator of three or more fractions.

(b) Reducing miles to half inches.

7.—Say how you would explain to beginners the rule for subtraction, and illustrate your answer by this example: 806—527.

8.—Take the following sum in long division: £72185 13s. 2d. ÷ 163, and work it so as to show fully the value of each separate figure in the answer, and of each remainder.

9.—In giving lessons on counting to very young children, say what apparatus you would find useful, and how you would make such lessons effective if you had no apparatus.

10.—Give as many forms of mental exercise as you can contrive on the number 24.

11.—Explain what is the proper use of a ball frame or counting frame in teaching arithmetic. Suppose you had no such apparatus, explain how you might teach counting by any of the objects in the schoolroom.

12.—Notes of Lessons on multiplication of fractions, reduction of money, ratio, short division, multiplication of money, numeration and notation, long division, numeration, fractions, first lesson on practice, simple subtraction, rule of three by the method of unity.

13.—State how you would explain to a scholar in the Third Standard the value of the full remainder obtained in the division of 349 by 42, when the division is performed by the factors 6 and 7 respectively.

14.—Distinguish the teaching of the rule of three by the method of unity and by proportion, and compare their advantages.

15.—Write out a rule for converting a pure circulating decimal into a vulgar fraction, and work an easy example in such a way as to show the reason of the rule.

16.—Write out two or three problems in mental arithmetic requiring the application of three at least of the compound rules.

17.—Make and explain diagrams to illustrate the following:—

$$\frac{1}{2}(\frac{1}{2} - \frac{1}{4}) = \frac{1}{8}; (\frac{1}{2} - \frac{1}{4}) \div \frac{1}{4} = \frac{1}{2}.$$

18.—Work at full length an example in compound practice which will prove your process in this instance to be shorter than the ordinary method of compound multiplication.

19.—In teaching subtraction two methods are commonly employed, *viz.*, of equal additions and of decomposition. State and explain the method which you have been accustomed to employ, and set down a graduated series of sums leading up from the easiest to the most difficult process in subtraction.

20.—What is the meaning of the term "compound rules"? Why are they so called?

21.—To what common uses may the *avoirdupois*, *liquid*, and *square* measure tables be applied? Give examples of such mental problems as you would employ in each of these tables for Fourth Standard children.

22.—Write down the rules for working mentally the following sums: prices of dozens, of scores, multiplying by 99, and dividing by 60.

23.—A class can multiply by numbers up to 9. What intermediate steps of reasoning and practice are needed that they may be able to multiply intelligently by such a number as 67? Give more difficult examples of each step.

24.—By what illustrations on the B.B. would you prove to children that—

$$\frac{2}{3} \text{ of } \frac{3}{4} = \frac{1}{2}; \text{ and } \frac{3}{4} - \frac{1}{4} = \frac{1}{2}?$$

25.—Name those tables of weights and measures that should be first taught to children. Justify your selection by the uses to which the selected tables are applied.

26.—Suggest some different methods for multiplying £3 11s. 9d. by 99. Show which you consider to be the shortest or simplest way. Would you think it advisable to teach young children more than one method? Give your reasons.

27.—A class of infants understand the notation of numbers up to (but not including)

10. How would you proceed to teach them the notation of numbers between 10 and 20? Say especially what illustrations you would use.

28.—In learning the multiplication table, which products do children commonly find most difficulty in committing to memory? Account for some of the most difficult cases.

29.—What immediate steps are needed in leading a class which can multiply by 7 to multiplication by 777?

30.—How would you commence teaching arithmetic in an infant school, and how far do you think children under seven may be expected to go in learning arithmetic?

31.—Give some examples of suitable exercises in mental arithmetic adapted for scholars of the First and Fifth Standards respectively.

32.—Of the two methods of explaining subtraction—(1) equal additions; (2) decomposition—which do you prefer, and why? Illustrate your answer by an example fully worked out.

33.—Make four sums such as would be properly suited to test the proficiency of a scholar in the Fifth Standard; and give a few examples also of the sort of questions in mental arithmetic which such a scholar should be able to answer.

34.—What objects should be kept in view in the teaching of mental arithmetic? Say how these objects may be best attained, and give some examples of good oral exercises suitable to the Second Standard.

35.—Show how you would explain to a class of beginners the *reason* of any *one* of the following processes in arithmetic: (a) ascending reduction; (b) subtraction of fractions; (c) cancelling.

36.—Multiply 74086 by 900, and explain, as to a class, the process of working, and the separate value of each line of figures.

37.—State and explain, as to a class, the rule for the multiplication of a whole number by a fraction.

38.—Describe some varied exercises in mental arithmetic suitable for scholars either—

(a) In an Infant Class; or

(b) In the Fourth Standard.

39.—What useful purpose is served by analysing a sum in arithmetic, and showing the separate value of each figure? Illustrate your answer by working the following question in long division: -

$$537682 \div 37.$$

40.—Explain, as to a class of scholars, the rule for cancelling in either fractions or proportion, and give some examples.

41.—Name some of the most effective visible and tangible illustrations for use in teaching either (a) *Notation*, or (b) *Practice*.

42.—Make some mental exercises on money suited for the First and Second Standards, and let them be as varied in form as possible.

43.—Explain how you would make young children familiar with the right use and value of the figures 1 to 7 as the notation for 17.

44.—What are the shortest processes of working mentally the following sums:  $57 \times 25$ ; 3 doz. articles at 74d. each;  $85 \times 99$ ?

45.—Describe your method of teaching infants between six and seven years of age to carry in addition, and say by what sort of visible illustration you could be helped to make the rule intelligible to such a class.

46.—Give examples of questions in mental arithmetic, suited to children of the Third Standard, which shall illustrate all the rules taught to children of that Standard, and shall prepare them for the work of the Fourth.

47.—Show by what sort of visible objects and illustrations you could make the rule for the addition of fractions intelligible to a class of beginners.

48.—Give some examples of exercises in mental arithmetic suitable for the highest class in a school, and show by what means rapidity and accuracy can be best secured in conducting such exercises.

49.—Give some hints for making oral exercises in arithmetic interesting.

50.—Explain any way you know of making clear to the eye the process called multiplying  $\frac{3}{8}$  by  $\frac{1}{4}$ .

51.—Take the number 50 and say how many forms of mental exercise you could devise with that number for a class of children in Standard I., so as to give them some early acquaintance with concrete and fractional, as well as simple arithmetic.

52.—Frame three sets of arithmetical questions suited for scholars in the Fourth Standard, so as to test knowledge of the reasons of rules as well as the power of applying them.

53.—Say what sort of pictorial or other visible illustration you would use in teaching the elements of arithmetic to very young children, and show what use you would make of such illustration.

*This Chapter is continued in the Appendix.*

## CHAPTER IX.

### READING.

#### **Its Value.**

No branch of school education is more valuable than reading, and none is more important. Its uses and applications are so numerous and far-reaching that its value becomes self-evident. Nearly every branch of school work is affected by it, and education goes on by means of it as long as life lasts. It is a great aid to mental and moral culture; it records and lays bare the progress of the world, and it is the great enemy of ignorance and superstition, which often are the forerunners of sin and suffering. It adds immensely to the pleasures of mankind, and may be made a healthy form of mental recreation. Books are largely the vehicles for information, and now-a-days without our newspapers we are "out of the world". Bacon says that where there is little reading there is need for much cunning; the former is within the reach of all now, the latter is the attribute of the few. The ability to read also prepares us for our great field of literature, with all its attendant advantages. The mind, like the body, needs exercise, and some of the most suitable and enjoyable forms of mental exercise are to be found in reading.

#### **General Principles.**

The teacher must remember the nature and extreme difficulty of the work he is attempting; and there are certain broad principles or general rules, the remembrance and application of which will tend to minimise these difficulties. There is no royal road to reading, but there are certain well-formed tracks along which the way is shorter and the work easier.

**1. Nature of the Acquisition.**—Reading is a triple task; there are the idea in the mind, the spoken words, and the symbols representing those words. That is, there are the idea, the sound, and the symbol. If the idea is translated by sounds we get spoken language; if by written or printed symbols, we get reading. The first combination is already formed when children enter school,

for they have within certain limits learned to express their ideas by sounds (words). The teacher's work is to form the combination between the words and the symbols, *i.e.*, between the sounds and the characters which represent them. This is a long and difficult task, requiring skill, method, and patience, which the teacher must always be prepared to give.

**2. The Sequence in Teaching.**—As in all other subjects of instruction the sequence in teaching must be observed. The teacher must proceed from the *known to the unknown*, and from the *simple to the complex*.

(a) *From the Known to the Unknown.* A beginning must be made with words, and not with letters. Children already know many words as sounds and the meanings attached to them, as their use of them shows; but probably they know little or nothing of letters, hence to begin any system of reading with letters is to violate one of the cardinal principles of all teaching. It is the violation of this principle that constitutes one of the great blots in the synthetic methods (alphabetic and phonic methods).

(b) *From the Simple to the Complex.* This is specially important, but it seems in some measure to conflict with the preceding principle as far as reading is concerned. If we always started with the known we should have to begin with the most familiar or the oft-recurring words. But these are generally the words of most irregular notation, and therefore, in one respect at least, the most complex to children. Several times it is pointed out in this chapter that our system of spelling is most anomalous and defective, and the introduction of these anomalies at this early stage would give a series of shocks to the child, and destroy its confidence. So far as possible, its faith in law and regularity must be maintained; but if reading is to proceed from the known to the unknown, these anomalous words must soon be presented to the child with their attendant difficulties. It is wise to point out this difficulty, but it is largely dependent on the method used, as will be subsequently seen. So long as the Look-and-Say (analytic) method is used, it is absent or minimised; and it only makes its appearance to any appreciable degree with the introduction of the synthetic methods; and the lesson to be learned is not to be too anxious to introduce the synthetic method to any great degree in the early lessons on reading. Even when it *is* introduced, there are plenty of short, easy words of regular notation which lend themselves to synthetic treatment.

(c) *The Artistic Element.* There is yet another reason why reading should begin with words rather than letters. Written or printed words are forms, and form, which is a matter for the eye, should be mastered as a whole. The parts may give no idea of the whole; the whole may give ideas of the parts.

**3. Interest.**—The teacher must study to maintain *interest*; and to do this he must seek to create a love for the subject. The *subject matter* of the lessons must be suitable, and intrinsically interesting. (For further information under this head the student is referred to the sections on Reading Books and Fairy Tales.) The *teacher's manner* must be pleasant and winning, his *methods* must be sound and scientific, based upon knowledge of child life and child mind. The lessons must be *graduated*, and a skilful use should be made of those useful aids, *comparison* and *contrast*. As soon as possible the scholars' assistance in the *detection* and *correction* of errors should be enlisted, and they should be made to feel that they are sharing the work and responsibility with the teacher. *Explanations* should be introduced in a suitable manner, and at suitable times, and there should be no *interruptions* or distractions either physical or mental. There should be no glare of light, no noise, no uncomfortable seats; nor should ill-placed spelling or explanation be given by the teacher, nor bad discipline tolerated from the class.

**4. Assistance.**—The amount of assistance rendered should vary. In the

earlier lessons much help will be required, for in school work *teaching should precede learning*. The B.B. can be freely used, words can be classified and syllabified, plenty of pattern work can be given for imitation, and writing can be made to assist. But as the scholars become older more work should then be thrown upon them. Help will still be required, but it will be for other aspects of the subject, so as to produce expressive reading.

**5. Correction.**—When giving the class practice in reading the teacher should listen with *closed book*. He will thus be in a better position to correct *all* kinds of errors, whether of word saying, of articulation, enunciation, or expression. Good reading places the listener in as good a position as the reader, and unless the teacher feels himself to be in that position, he knows that there is something needing correction. These corrections should always be made in a nice way, or there may be set up an unpleasant association which will handicap all subsequent efforts in these lessons.

**6. Amount.**—The amount attempted must always depend upon such factors as the following:—

- (a) The nature and extent of *local provincialisms*.
- (b) The *intelligence* of the children, and the extent of the *curriculum*. These should be interdependent. In a "slum" school or in a village school the same amount can hardly be expected as in the more favoured districts.
- (c) The *length of time* the children stay at school, and the degree of *regularity* attained.
- (d) The amount and quality of the *staff*.

There will always be favoured children, with special aptitude for reading. This fact is within the experience of every teacher. But the gifted must not be chosen as a standard for the others. The average ability and the average opportunities of the class should be gauged, and the quantity of the work should be apportioned accordingly. A little well done is better than a dabbling with much.

### Age to Commence the Teaching of Reading.

There is a general opinion among experts that no instruction should be attempted in the elements of reading, writing, and arithmetic until the age of five; and this fact receives official sanction, for children are not *compelled* to attend school before that age. But this opinion is not shared by many of the ablest infant school teachers in the country. "On the contrary, it is often found in practice that piecing little words and sentences together with a movable or picture alphabet, imitating the forms of letters and figures with paper patterns or pencils, and counting the objects around them are occupations not more laborious, and certainly not less interesting, than many of the exercises of the kindergarten. Moreover, it is found that by the judicious admixture of exercises on simple words and on numbers, with other infantine employments, little children frequently overcome some of the earlier difficulties of reading and writing almost unconsciously, and before they are aware that they are difficulties. . . . Having regard to the short period of school life among the children of the labouring class, and to the indispensable importance of the three elementary subjects, it must always be held to be part



of the office of the preparatory or infant class to provide the rudiments of instruction in these subjects."

### **Infant Reading and its Difficulties.**

#### **I. Work of the Infant Stage.**—This should be threefold:—

1. To teach the letters and their powers.
2. To teach the combination of the letters into small or easy words.
3. To teach the combination of little words into simple sentences.

#### **II. Difficulties.**

##### **1. Physical.**—These fall easily under four heads.

- (a) *Distinct Articulation.* The vocal organs of young children are sometimes but poorly developed, and others are defective. The distinct articulation necessary for pure pronunciation is the result of careful culture and growth. The *imitative faculty* must be freely used. The shape of the mouth and the position of the tongue should be frequently shown, and much patience should be exercised towards the dull and stupid. Common errors should be met with *systematic vocal drill*, and *exercises* should be formed by the teacher for class practice. These should take the form of short sentences; e.g. —

##### *Vocal Difficulty.*

##### *Exercises.*

*th:* The mother and father went with them.

*r:* He rode round the broad road on a brown horse.

- (b) *Voice Modulation.* Too often the reading of young children is a series of jerky monotonies. There is no cadence of voice to indicate the sense of the passage. This can only be met by plenty of *pattern work* and by *imitation*. A little explanatory conversation on the subject matter of the lesson may sometimes add intelligence to the reading, which may show itself in an improved vocal delivery, but, as a rule, the other methods will have to be relied on.
- (c) *Weak Attention.* The power of concentration is very small in children. Sustained attention is physically exhausting, so that only reasonable demands should be made upon them. Concentration is a slow growth; hence there should be *short lessons* and *suitable changes*. *Interest* is a great factor in attention, and the teacher must seek all legitimate devices to arouse and maintain it. By-and-by *habit* begins to assert itself, and attention follows as a matter of *custom* and *association*.
- (d) *Constitutional Difficulties.* There may be a weak constitution, a timid nature, bashfulness, shyness, all of which may result from physical causes. Laziness may be another result.

##### **2. Mental.**

- (a) *Association.* There is a threefold association to set up (see General Principles). This association requires time and some ingenuity to form it intelligently.
- (b) *Intelligence.* Intelligent reading should be expected of children. They read childish books dealing with the common experiences and incidents of child life, and therefore their reading ought to indicate understanding of the subject matter. The words require grouping or phrasing according to the sense; i.e., *the reading should be notional*. It is a difficulty which receives increasing attention as the difficulty attached to word-naming (recognising and saying the words) grows less. It is ignored in the earliest lessons. In the later lessons it is of primary importance, and practically monopolises the teacher's attention.

- (c) *Defective Alphabet.* Most childish difficulties arise from this source. There are 42 elementary sounds in our language, and only 26 letters to express them. Furthermore, some of these letters are redundant, some are silent, and some sounds are represented in several ways. A child having learned *go*, *no*, and *so* is staggered to find the *o* different in *to* and *do*. There is a breach of expectation, a shock to childish confidence, which breeds timidity and distrust of all future phonetic attempts.

**3. Moral.**—A child may be wilfully inattentive, through some fault of temper like obstinacy or sullenness; or from laziness, and laziness in healthy people is not far removed from imperfect morality.

### To Teach the Alphabet.

Whatever method of teaching is adopted, the alphabet will have to be learned sooner or later, but do not begin with it. Begin with small words, as already instructed, and for the reasons already given. If the teacher wishes to concentrate the work, he could adopt some such system as "Livesey's Object and Word Method". Eight common objects, or pictures of them, could be shown, the words printed on the B.B., or some other apparatus like the word-building frame could be used, and these words could be dealt with until all the letters are known. The words given are *can*, *box*, *jug*, *fez*, *drum*, *quill*, *whip*, and *key*, but the teacher could form other words for himself if necessary.

**I. Apparatus Required.**—Some or all of the following should be used:—

- (a) B.B., chalk and duster.
- (b) Cards of letters; one capital, and one small.
- (c) Kindergarten sticks.
- (d) Picture letters.
- (e) Word-building frames and solid letters.
- (f) Slates suitably ruled, and pencils for drawing the letters.

**II. Capital Letters.**—These should be taught first, and this may be done in several ways.

#### 1. By Simple Recognition.

- (a) *In their order.* This is the worst method.
- (b) *By grouping according to their elements.* This may be a good method for teaching the *writing* of the letters, but it has no special claims for reading.

#### 2. By Memory Aids.

—These will include:—

- (a) *Picture cards*; e.g., A is the archer, etc. This is the principle of *association*.
- (b) *Kindergarten sticks.* This is slow, but sure and interesting.
- (c) *Letter box or word-building frame.* The principle is the same in either case, and the teaching should arouse curiosity and maintain interest.
- (d) The B.B. may be used alone, or in conjunction with one or more of the other aids. The letters should be printed one at a time on the B.B.

### III. Plan of Lesson.

1. Take a group of easily constructed letters—I, X, Y, T, L, H, etc.
2. The letter I should be taken first as the simplest and easiest. Print it on the B.B. Name it. The children must repeat the name whilst looking at it.
3. Next take the *card of capital letters*. Class to point out the I.
4. Then let the children pick it out from the *box of letters*.
5. The same letter might then be picked out from the *picture cards*.
6. Now let all the children make an I with *kindergarten stick*.
7. Take another letter (T) and proceed in same way.
8. The two letters can then be formed into a word, IT.
9. The remaining letters could be taught in same way, and where possible *little words* should be formed and learned.
10. Later on the children should *write the letters on their slates*—
  - (a) From a copy.
  - (b) From dictation.

### IV. Small Letters.

1. Teach those first which are *most like the capitals*; e.g., c, o, x, z, y, w, s.
2. Group those likely to be *confused* and *compare* and *contrast* them; e.g., b, d; p, q; m, n, u, v.
3. When the small letters have been learned, place them side by side with the large ones, and let the children *compare* and *contrast* them. Then *mix* them and let the class name them picked out at random.

### Classification of Letters.

1. **Capitals.**—In classifying the capital letters for the purpose of teaching the alphabet the teacher must remember that *sight* is to be studied more than sound, as reading is a matter for the eye. *So far as possible, the groupings should have some common element, for in comparing letters points of similarity are more important than points of difference.* Hence the *form* of the letters should be the basis of classification adopted.

- Class 1. Common element, *straight line*, I, L, T, H, F, E.  
 " 2. " elements, *straight and oblique lines*, A, V, W, X, Z, N, M, K, Y.  
 " 3. " element, *curve*, C, G, O, Q, D, U, S, J.  
 " 4. " element, *curve and straight line*, P, B, R.

2. **Small Letters.**—These do not lend themselves so readily to classification by form. Nevertheless it is the proper and best classification for the reasons given above.

- Class 1. Common element, *right line*, l, i, t.  
 " 2. " oblique line, y, w, k, y, z.  
 " 3. " right line with hook, m, n, u, r, h, f, j.  
 " 4. " curve, c, e, x, o, g, a, s.  
 " 5. " right line with curve, b, d, q, p.

### First Lessons after the Alphabet.

**Object.**—The object is *to teach the powers of the consonants and words of two letters*. It is assumed that the class knows the alphabet and the powers of the vowels.

**Apparatus.**—B.B., chalk and duster; card with words of two letters; letter box and kindergarten sticks.

#### Lesson.

1. Print a vowel (say A) on the B.B. Class to name it.
2. Place some consonants, one by one, before it, as *ba, da, fa, la, pa*, etc. Class to watch the teacher's mouth while he slowly pronounces each syllable, afterwards repeating each syllable after him.

3. Now let the children take the same consonants with another vowel (E). A new set of syllables is produced, as **be, de, fe, le, pe**, etc. The teacher goes through the same steps as before, the class carefully noticing his mouth.
4. Then let the teacher *contrast* the two series, placing them side by side, and having them repeated alternately; e.g., **ba, be, da, de**, etc. A few combinations like this will be enough for one lesson. Do not weary the children so as to breed a dislike for the work.
5. Then to fix the syllables let them form them with their *kindergarten sticks*, and repeat them when formed. They should next form the same syllables from the *letter box*, going through the same process.
6. As a final exercise the syllables might be repeated first *simultaneously* and then *individually*.

### Card and Primer Stage.

**Object.**—To teach words of 3 or 4 letters, or even more letters when the words are common; also to teach the powers of the letters in combination.

#### Apparatus.

1. A set of cards containing easy words of 3 or 4 letters.
2. A very easy primer containing not more than 40 pages. The book is to be printed in large type; the words of more than one syllable are to be divided, and the book should be well illustrated. *A child's first acquaintance with a book must be a pleasant memory.*
3. Use the cards at first; then sometimes cards and sometimes books; then books alone.

#### Lesson.

1. The earlier cards might be arranged on the Phonic Method. The teacher could name the first sound, the class could repeat it simultaneously, then several pupils individually; e.g., **-at, f-at, r-at, h-at, p-at**, etc., *the teacher prefixing the consonants.*
2. Then *double consonants* might be prefixed—**ff-at, br-at, ch-at, sp-at**, etc. The children again to repeat after the teacher.
3. A few other combinations might be treated in the same way. In each case the teacher must test by sample.
4. A card should then be taken containing short sentences embodying the words thus taught, and these words should be read by the class. If there are no suitable cards the sentences should be written on the B.B. Too much word building is wearisome in one lesson: it is *reading* that interests the children.
5. When all the words of a sentence are known the sentence may be read with *expression* by the teacher, the children copying. There will probably be need to exaggerate the emphasis for young children, for they rarely reach the standard set them.
6. Any *difficult words* should be written on the B.B. during the lesson, and spelt and learnt orally within reasonable limits, for it is not advisable to have too much interruption in a reading lesson.
7. A few lessons of this kind will enable the children to use the *cards* and *primers* very soon. With these the teacher should read *single words*, the class repeating after him until a sentence is known. This should then be re-read by the teacher for proper *expression*, the class imitating, and several scholars following individually. Each sentence can be mastered in this way.
8. The *paragraphs* should be recapitulated in the same manner as sentences. This will supply the very essential element of *connected* reading, which is a pleasurable acquisition to most children.
9. Finally the *whole chapter* should be thus recapitulated. The teacher will now be able to read the chapter in sentences, paying great attention to enunciation and expression.

**METHODS OF TEACHING READING.**

The difficulty and importance of reading as a subject of instruction are shown by the methodised attempts that have been made to improve its teaching. There are a number of methods in use, and, as usual, where interest or necessity has called forth many efforts, there is the usual conflict of opinion as to the relative merits of the various systems in use. Each of the best known systems is here dealt with briefly. The salient points are noticed and followed with a criticism in each case. The best known of the methods are the following:—

1. The Alphabetic Method.
2. The Phonic Method.
3. The Phonetic Method.
4. The Method of Phonic Analysis.
5. The Look and Say Method.
6. The Syllabic Method.
7. The Combined Method.
8. The English Method.

Some of these are analytic, some synthetic, whilst some are more or less a combination of the two. But whatever method may be used, there are certain *general principles* or processes of instruction, which must more or less regulate all methods. There must always be:—

1. Preparation by the teacher.
2. Pattern work by the teacher.
3. Imitation by the class.
4. Correction of errors.
5. Plenty of practice (individual practice is the best).
6. Examination.

**THE ALPHABETIC METHOD.****Description.**

It is called the Alphabetic Method because it associates the sound of a word with its sign through the medium of the series of its letter names taken either collectively or syllabically. Printed words are placed before the child, and its attention is directed to each letter in succession. The teacher names it distinctly, and the child pronounces it after him. In this way the scholar is expected to learn the alphabet first. The method may be briefly described thus:—

1. The alphabet is learned as already pointed out.
2. The vowels are then associated with each consonant in turn; *e.g.* :—

at, et, it, ot, ut,  
ab, eb, ib, ob, ub,  
ac, ec, ic, oc, uc, and so on.

3. Then a consonant is affixed ; e.g. :—  
bat, bet, bot, bit, but,  
dab, dib, deb, dob, dub, etc.
  4. The short vowels are then lengthened by the addition of e ; e.g., bate, bete, bite, bote, bute.
- It is a word building *synthetic method*.

Advantages.	Disadvantages.
<p>1. It is claimed that it is a method for <i>teaching reading and spelling together, and the reading through the spelling</i> : but this is hardly true. The converse is the case.</p> <p>2. There is a <i>saving of labour</i>, the work requisite for learning the one being made available for learning the other.</p> <p>3. It has the <i>sanction of long usage</i>, but is now rapidly becoming obsolete.</p> <p>4. <i>It appears to be the natural method</i> to begin elements, and to proceed to combinations ; i.e., from the simple to the complex.</p> <p>5. The sounds of the letters composing words when uttered in quick succession sometimes suggest the sound of the word itself.</p>	<p>1. This combination of teaching reading and spelling together is <i>awkward and unnatural</i>. In many irregular words the spelling is a <i>hindrance</i> to acquiring the word sound.</p> <p>2. The saving of time is illusory, for one subject interferes with the other ; and the introduction of awkward and useless spelling combinations is a <i>waste of time</i>.</p> <p>3. Spelling rests on a habit of the eye, and therefore <i>this method inverts the proper relation of these subjects</i> ; for reading gives natural facilities for learning spelling, whereas by this method those facilities are lost, because the attention is distracted from the reading to the spelling.</p> <p>4. Our alphabet is very imperfect, hence any method of teaching reading based upon it must necessarily be <i>imperfect</i> also.</p> <p>5. It encourages <i>indolence</i>, for frequent repetitions of the letters of a word will at length suggest the word itself, and consequently the learner does not put forth the necessary degree of attention for mastering words.</p> <p>6. It is <i>contrary to the actual method of acquiring spoken language</i>. In talking a child learns <i>words</i> first.</p> <p>7. The method is <i>t tedious</i>, and very often produces a dislike for reading.</p> <p>8. <i>It is wrong in principle</i>. It applies synthesis to the mastery of form by the eye ; whereas form must first be learnt as a whole.</p>

## THE PHONIC METHOD.

### Description.

The Phonic or Sound Method associates the sound of the word with the *letter sounds* composing it. The powers of the letters or sounds are associated with their shapes. The child then constructs the sound of the word for himself. The method professes to teach each sound, and to have it separately uttered before pronouncing the word. In the first lessons plenty of drill in the phonic alphabet is given. It is a *synthetic* method, and practically it has three stages :—

1. The analysis of the sound of a word into its component sounds.
2. The power to recognise the picture (letter) of the sound, and to articulate it.
3. The application to new cases.

Taking any common word as an illustration, the process might be as follows:—

1. Take the word **bat**, and try to give the sound of each letter in it, thus **bē-a-tē**.
2. Then pronounce the word **bat**. Get the pupils to notice the sound of your lips, and their position, whilst saying **b**; then say **ba**. The children notice the difference at once, and can then imitate these sounds.
3. The *reverse process* is then pursued. The entire word is sounded, and the children are required to give the sounds of the letters.
4. A picture (**b**) of the sound is then shown. The usual devices must then be used for fixing the picture and the sound.
5. Lip work or *silent spelling* then follows. The children watch the teacher's mouth, and recognise the letters from the shape of the lips. The same process in its entirety should be adopted for other letters.
6. The sound of two or more letters in combination like **a-te** is next taught.
7. Other letters with which the children are familiar could then be prefixed, and the words sounded; e.g., (**b**)at, (**c**)at, (**p**)at. This is an exercise in *word building* or *vocabularies*.
8. The last step should be the combination of the words learned into *easy narrative*.

Advantages.	Disadvantages.
<ol style="list-style-type: none"> <li>1. If adopted <i>in its purity</i> it would greatly facilitate the process of learning to read. It is asserted that it extends the words of regular notation to 75 per cent. of the whole, leaving 25 per cent. only for the Look-and-Say Method.</li> <li>2. It is a good method for obtaining <i>good articulation</i>, and accurate and careful <i>enunciation</i>.</li> <li>3. Theoretically the method is sound, the pronunciation of a whole being taught by the pronunciation of the parts.</li> <li>4. It teaches reading and spelling together.</li> <li>5. It enables children to apply their knowledge to fresh cases.</li> <li>6. Some teachers have made it very effective; and more or less it forms part of the methods used by most teachers.</li> </ol>	<ol style="list-style-type: none"> <li>1. A purely phonic method is possible only where the number of letters and elementary sounds correspond. But in English the letters are only five-eighths of the elementary sounds.</li> <li>2. The same letter ought always to represent the same sound, but one letter often represents two or more sounds.</li> <li>3. Some sounds are represented by more than one letter.</li> <li>4. Some letters are silent.</li> <li>5. "It is nothing but a variety of the Alphabetic Method with other names to the letters."</li> <li>6. <i>It is wrong in principle</i>, as it applies synthesis to the mastery of form by the eye.</li> <li>7. The system is <i>too elaborate and too complex</i> for rough usage.</li> <li>8. It <i>requires special preparation</i>, and therefore cannot very well be entrusted to a young teacher.</li> <li>9. The attempt to give the powers of the labials, dentals, and liquids, has a tendency to induce <i>stammering</i>.</li> </ol>

## THE PHONETIC METHOD.

### Description.

This is a method designed to meet some of the difficulties of the Phonic Method. The *principle* of the method is that the rapid

utterance of the sounds of the letters of a word will give the sound of the word itself. Each of the ordinary letters has a single sound, and then the rest of the elementary sounds of the language are provided for by variations of the letters in use. These variations are expressed by means of *diacritical* signs; e.g., the letter *a* has four sounds, which are thus expressed:—

- |    |         |          |       |               |
|----|---------|----------|-------|---------------|
| 1. | No mark | <i>a</i> | as in | <i>cat</i> .  |
| 2. |         | <i>ā</i> | „     | <i>fāre</i> . |
| 3. |         | <i>ä</i> | „     | <i>cär</i> .  |
| 4. |         | <i>â</i> | „     | <i>câll</i> . |

This arrangement extends the alphabet to 65 symbols, 32 of which are vowels, and 33 consonants. The distinction between some of the symbols is very fine, and it requires care to distinguish them. *Type* arrangements help. *Silent letters* are printed in italics, as *dumb*, *knife*; while *whispered consonants* are done in light type, as (s)ing, (s)ound. The *diphthongs* are expressed by means of *diagraphs*, as b-oa-t. The sounds of this extended alphabet are given first, and the word sound is then supposed to follow, and the nearer the alphabet comes to perfection the truer this is. After the lessons have been given in the extended alphabet, they are then repeated in the ordinary alphabet.

**Criticism.**—The advantages of this method are much the same as those of the Phonic Method, but it only removes some of the disadvantages of that method to make room for others. The first four difficulties disappear with the extended alphabet, but the others remain, and are reinforced by the following additions:—

1. The new letters make it look like a strange language.
2. It destroys the face history of words and their origin.
3. Special books are required.
4. There are two alphabets to learn, and one of them a very long one, with very fine differences. Hence the work becomes wearying, tends to confusion, and proves a hindrance rather than a help to acquiring the art of reading, for in some cases two forms for the same word have to be learnt.
5. It does not remove the difficulties of our alphabet; it only postpones them.

## THE LOOK-AND-SAY METHOD.

### Description.

This is a method of reading without spelling. Each word is taught as a whole, and its sound is associated with it as a whole. The learning of the alphabet is no part of the plan, although it gets to be known by the children. The method may be briefly illustrated as follows:—



1. The teacher takes a reading sheet containing short sentences. He points to a word, pronounces it, and the class repeats it after him. A sentence is thus read.
2. He then requires the class to read the same sentence simultaneously as he points to the words.
3. Then some child is selected to read it.
4. The teacher might then point to the same words in other parts of the sheet, and ask the children to name them.
5. The children next begin to notice differences in apparent similarities, *e.g.*, *felt* and *left*; *saw* and *was*; *on* and *no*. Up to this point the child has only noticed form as a whole. Now the *analytic* process begins, and he recognises some of the elements.
6. The children might next be introduced to books. They should always point to each word as it is read. As they improve in their reading this becomes less important, and eventually it may be dropped altogether.

Advantages.	Disadvantages.
<p>1. The word is mastered by the eye. Children <i>talk words</i> when they enter school; now they learn to recognise <i>pictures</i> of words. The child has something to start with, and so starts with some advantage.</p> <p>2. It enables the child not only to <i>recognise the word in the sign</i>, but to acquire practical acquaintance with the <i>powers of letters and syllables</i>, for it associates sound, sign, and idea, in a natural way.</p> <p>3. It is <i>suited</i> to the circumstances of common schools.</p> <p>(a) It meets the best requirements of class instruction by stimulating <i>attention</i> and <i>self-respect</i>. <i>A child learns to read quicker by this method than by any other</i>, and it brings <i>interest</i> because the child is dealing with words which it knows.</p> <p>(b) It requires <i>no special preparation</i>, and so can be entrusted to a young teacher.</p> <p>(c) It <i>impresses by frequent repetition</i>. Many words can be learned by no other method, and these are the most common in child vocabularies.</p> <p>4. "It gives more practice in sounding letters in combination, hence the necessary <i>mental generalisations</i> for acquiring the powers of letters and syllables are more readily acquired."</p> <p>5. It is the method which forms the basis of the methods adopted by most teachers. Few, perhaps none, use it in its purity, but many approximate to it.</p>	<p>1. It is a <i>Chinese method</i>. This is an unjust and an untrue criticism, for although each word symbol is learned independently, yet when the word is known as a whole it is analysed into its elements. In Chinese no such analysis is possible. This objection is wrong in another point; it assumes that the method gives no power to master new words.</p> <p>2. A habit of <i>guessing</i> will be formed in the earlier lessons, unless great care is exercised.</p> <p>3. It may produce <i>carelessness</i>—words of similar form are sometimes confounded—<i>indistinct articulation and bad enunciation</i>.</p> <p>4. It requires <i>supplementing by the Phonic Method and by transcription</i>. Some assert that the power to apply the knowledge of reading to new words is not so rapidly developed as by the Phonic Method. This may be true for words of regular notation, but it is hardly true of the less regular words, which, be it remembered, are numerous and common.</p> <p>5. Unless the teacher exercises <i>great watchfulness</i>, its <i>moral effects are bad</i>. Pupils pretend to read or point, and so attempt to deceive the teacher.</p> <p>6. It may breed <i>laziness</i>. The idle or indifferent will seek to shelter themselves under the chorus of class voices.</p> <p>7. It may in some measure <i>demoralise the teacher</i> without zeal. The chorus of sound is supposed evidence of work, and he is content to rest to the hum of the voices. But this objection can only apply to simultaneous reading, and then it is true of all methods.</p> <p>8. <i>Spelling</i> is likely to suffer if the method is not supplemented.</p>

**THE SYLLABIC METHOD.**

This is only a modified form of the Look-and-Say Method. The principle is practically the same, for words are still learned as a whole for monosyllables. The variation occurs with words of more than one syllable. Briefly, the method may be summarised as follows:—

1. Words of *one syllable* are first mastered on the Look-and-Say Method.
2. The method then proceeds to *words of more than one syllable*, the words being carefully graduated.
3. *These words are then broken up into syllables*, words of regular notation being first taken.
4. The children are then *taught each syllable on the Look-and-Say plan*.
5. The *complete word* is then sounded.
6. The *syllables are always classified*, the commonest being taken first.

**THE METHOD OF PHONIC ANALYSIS****Description.**

This method is based upon the comparison of sounds, and, as its name implies, is a combination of the Phonic and Look-and-Say Methods. The idea is to use the Look-and-Say as a basis, then to combine the two, and, finally, for all words of regular notation, to use the Phonic Method. It is an attempt to combine the best points of the two most popular methods.

1. The *first lessons are on the Look-and-Say Method* for the acquirement of monosyllables and short irregular words of common use.
2. Next, *words are analysed* where they conveniently admit of it; e.g., **and** = **an-d**, **pad** = **p-ad**, **bad** = **b-ad**.
3. The *completing sound* (initial or final) is done by the *Phonic Method*; e.g., **h-am**, **j-am**, **s-am**, **r-am**.
  - (a) **Vocal.** The process is as follows:—The word **am** is slowly spoken, and the children are invited to watch the teacher's mouth at the time, noting the use of the vocal organs. Then the class utters the word. Repetition is given until a child learns how a particular sound is produced.
  - (b) **Symbol.** The word is next written on the B.B., and the initial or final letter is placed apart as above. The word is then slowly pronounced again, first the syllable, then the whole sound. The children are then told that the separated letter is the sign for the completing sound.
4. When a number of words have been learnt in this way they are compared. This *comparison* is an important element in the method, for the powers of the consonants are taught by means of it; e.g., (**c**)**an**, (**f**)**an**, (**m**)**an**, (**p**)**an**, (**b**)**an**, (**t**)**an**, (**r**)**an**, (**d**)**an**.
5. When the children have progressed thus far *phonic drill and comparison are used for the acquisition of new words*.
6. Words are carefully *classified*, the more irregular being introduced gradually.
7. *Sentence reading* follows each new acquisition and embraces any of the words already learned.
8. In the final stages the *Phonic Method* is used only.

Advantages.	Disadvantages.
<p>1. It is a <i>good spelling method</i>. The combination of the Look-and-Say and the Phonic is a good one.</p> <p>2. It gives a <i>certain amount of power to recognise fresh words</i> by directing the attention to the structure of words.</p> <p>3. It conduces to <i>good enunciation, articulation, and pronunciation</i> by teaching the powers of the letters.</p> <p>4. It is <i>less Chinese</i> than the Look-and-Say, and <i>less absurd</i> than the Phonic.</p>	<p>1. It is weak or <i>wrong in principle</i>, for it fixes the attention more on the parts than the whole.</p> <p>2. It is <i>not suited to the circumstances of many schools</i>, for it would require very careful preparation, and could not well be entrusted to a young teacher.</p> <p>3. <i>Special sets of reading books</i> would be required to suit the plan. A series of progressive, carefully graduated lessons would be required.</p> <p>4. As in the Phonic Method, the attempt to give the powers of the letters might induce <i>stammering</i> in some cases.</p>

### THE COMBINED METHOD.

The Combined Method, as its name implies, is a composition formed by contributions from all the other methods. Probably in no two schools is it alike, for the constituents are mixed by different teachers in different proportions. But whatever may be the relative proportions of the contributing methods, it is by common consent the best method, and for this reason we sometimes find it described as the *Eclectic Method*. Anything that is good in the other methods is appropriated, and, as far as possible, incorporated in this. *The Look-and-Say forms the basis*, but the *word building and spelling of the Alphabetic*, the *powers of the letters and the word building of the Phonic*, the *syllabic treatment of words of the Syllabic*, and the *analysis and comparison of the Phono-Analytic* are all used. Another great feature of the method is its *elasticity*. The teacher is at liberty to use any portion of any method at any particular moment, when it may be applied with most advantage. Probably most teachers knowingly or unknowingly use this method. It has already been pointed out that it may present any number of combinations, one of which is given as a sample. But the "personal equation" will always be an important factor in such a method as this.

1. The *alphabet* may be taught as in the *Alphabetic Method* by some of the many pleasant devices now in use.
2. *Easy words* could then be taught on the *Look-and-Say plan*.
3. The *powers of the consonants* could then be taught as in the *Phono-Analytic Method*.
4. *Reading lessons on the Look-and-Say plan* could still go on, but they should be varied and supplemented by lessons on *word building as in the Phonic Method*.
5. *Specially difficult words* could be written on the B.B., *analysed as in the Syllabic Method*, and *spelled as in the Alphabetic Method*.

6. *Simultaneous reading* could be practised on the *Look-and-Say plan* from the pattern work of the teacher.
7. Plenty of *individual practice* should be given, and the necessary corrections should be made in any method most suitable.

## THE ENGLISH METHOD.

### Description.

This is a method of teaching reading which has been elaborated by Messrs. Sonnenschein and Meiklejohn. It is a *word-building plan*, and an attempt to analyse and classify the fundamental combinations of the language. It is called the English Method.

The plan consists of four courses.

I. *The Nursery Book or Two Letter Word Sheets.* This book contains 17 lessons carefully graded, and the progressive nature of the lessons can be graphically represented thus :—

Lesson.	Consisting of
1	a, i.
2	a, i, o, go, so.
3	a, i, o, go, so, ho, lo, no.
4	a, i, o, go, so, ho, lo, no, ox, on, of, or, and so on.

II. *The First or AT Course.* This consists of short vowels with single consonants. It "consists entirely of A, E, I, O, U, with the addition to them of one letter in each lesson. The child is intended to learn one letter in each lesson—not its name, but its function or use. Capitals are introduced in the order of their difficulty, thus I or S is easier than P; P than G; and so on." "The child should write or print on his slate the *practice*, the *lesson*, and as many of the *sentences* as there is time for with neatness and clearness."

### Plan of a Lesson for First Course.

1. **Practice.**—The book is divided into sections, of which there are 23. Each section begins with a *practice*, which contains all the vowel combinations used in that section. The *practice* is read off on the Look-and-Say Method, both horizontally and perpendicularly, till the pupils know every syllable. The first *practice* is given in illustration.

at	et	it	ot	ut
et	at	ot	ut	it
it	ut	at	et	ot
ot	it	ut	at	et
ut	ot	et	it	at

2. **Lesson.**—The *lesson* then follows, in which these syllables are combined with a consonant **b**, hence we get lists of words and syllables such as *bat, bet, blit, bot, but*. Lists are made as in the *practice*, and they are first read across, then down, till known. The teacher then points at words here and there.

3. **Exercise.**—An *exercise* then follows of short sentences composed of words of two or three letters, like

it is on the bat;  
it is a bit of the bat.

Lessons and exercises then follow each other to the end of the section, towards which the exercises become more numerous.

4. **Second Practice.**—This introduces a *fresh combination*. Another consonant is chosen, and the same method is pursued.

III. *The Second or ANT Course.* This course consists of short vowels with double consonants. It is the first course, with the addition of a second consonant.

Lesson and exercise now follow each other, but the lesson is divided into two parts.

(a) Syllables are given to practise until fully known.

(b) These syllables are combined *instantaneously* into words of two syllables.

**The Bridge.**—There is a bridge between this course and the next. A series of words and syllables is given, and the pupil has to say which are words and which not; e.g. :—

at	et	ot	ad
lat	ret	lot	lad
flat	pret	plot	clad and so on.

The bridge is not introduced until the later lessons.

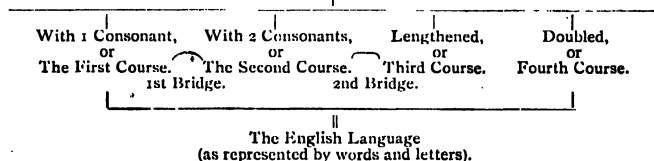
IV. *The Third Course.* This consists of long vowels. It is the first course again, "but with the vowels lengthened, and the learner will at once find that this comes about by the addition of a final *e*".

Stories then follow written without the help of any words with double vowels. Practice, lesson, and exercise follow each other as before.

V. *The Fourth Course* contains all the double vowels in the language with apparent anomalies, and some words that cannot be classified.

The whole method may be graphically illustrated as follows :—

A, E, I, O, U.



#### Advantages.

1. It is *synthetic*.
2. It is *well graded*. The lessons are progressive and systematic. Difficulties are carefully bridged.
3. It introduces plenty of *recapitulation*.
4. It enables the pupil to see the *symmetry and regularity* of the English language as a whole.
5. It soon gives the pupils a *feeling of mastery and a sensation of progress*.
6. Children trained on this system have always been thoroughly *good spellers*. They spell by principle and law.
7. It is *thorough and comprehensive*. By the arithmetical process of permutations and combinations every actual and possible syllable in the English language is introduced, and accepted or rejected as is considered right in each individual case.

#### Disadvantages.

1. It is *unnatural*. Children should learn to read as they learn to talk. Words are not difficult for reading purposes altogether, either from the fewness or from the number of their letters, but from their degree of familiarity or otherwise to the children.
2. Like all synthetic methods it is *wrong in principle*. See Alphabetic Method, Disadvantages, 8.
3. It is *dull and uninteresting*. It is difficult to conceive any love for a subject hanging round such a bag of dry bones. Children trained under this system, who have developed a love for reading, must have acquired that feeling from the personal qualities of the teacher or themselves.
4. It may make good spellers, but this is a reading system and not a spelling one.
5. Speaking generally, it is a well-classified edition of the Phonic System, and has many of its disadvantages.
6. It is *not popular*. Relatively few teachers know it, and fewer practise it, although it has already attained its majority.

## NOTES OF A READING LESSON.

### I. Preparation

#### 1. Language.

The chapter should be read through and marked.

1. To show the amount read by each child.
2. To mark emphasis and accent where necessary.
3. To prepare a list of difficult words for learning.
4. To mark words producing provincialisms.
5. With a young class to prepare a list of words likely to be confused, e.g., *saw* and *was*, or mispronounced.

#### 2. Subject Matter.

1. Explanation of allusions (if any).
  2. To prepare a few illustrations (if necessary).
  3. To be able to give a brief explanation of the whole chapter.
- As a rule the mechanical difficulties will be the chief with a young class, but generally the difficulties will depend upon—
- (1) The attendance.
  - (2) The ability and zeal of the teacher.
  - (3) The subject matter read.
  - (4) The arrangement of the time table.

**II. Sample of Subject Matter.**—In writing notes for a reading lesson it will only be necessary to take a portion of the subject matter to show how you would deal with it.

"Who is this that cometh from the south, thinly clad in a light *transparent garment*? Her breath is hot and *sultry*; she seeks the *refreshment* of the *cool shade*; she seeks the *crystal brook* to bathe her *languid limbs*. The *tanned haymakers* welcome her coming, and the *sheep shearers* who clip the *fleeces* of his flock with his *sounding shears*."

### III. Introduction.

1. The class must be properly arranged. This will depend upon the nature of rooms and the space at the disposal of the teacher. Where possible the class should always stand for reading—
  - (a) In semicircular drafts for small classes.
  - (b) In parallel rows, the shortest children being in front, for larger classes.

In many of our large modern schools the children have to take their reading lesson in the desks.

2. Arrangements should be made for the proper and orderly passing of the books.
3. The position of each child should be comfortable and orderly.
4. There should be a few minutes' conversation on the subject matter to ensure understanding.
5. New words and difficult words should be written on the B.B., and rapidly learned. There need be no explanation at this stage.

**IV. The Lesson.**—There are two chief objects which must be kept in view in giving the lesson.

1. To extend the pupil's knowledge of language by enlarging his stock of words, and making them plain to him.
2. To enable him to grasp the ideas in his book, so as to get intelligent reading.

### A. Mechanical Difficulties.

1. **Pattern Reading.**—The teacher will pattern read for imitation by the class. This may be done by sentences, by several sentences, or by the class. The wants and abilities of the classes must decide how. After the primary

pattern reading of the teacher, *secondary pattern work* may be given by some of the better scholars. Where the class possesses some very good readers, much of the primary pattern work should be thrown on them.

**2. Imitation by Scholars.**—The scholars will then imitate the pattern set them. This again may be varied. It may take the form of—

(a) Individual imitation.

(b) Sectional imitation. This is a useful practice, as it arouses emulation.

(c) Class imitation.

**3. Practice: Simultaneous and Individual.**—Plenty of time should be allowed in the lesson for practice in reading unpatterned portions. A portion might be read individually, and then simultaneously. The object should be to give as much practice as possible.

**B. Difficulties of Language.**—The amount and quality of the explanation will depend upon the class. As a rule, too much should not be attempted, but no dogmatic directions can be given. The anticipated difficulties should be underlined in the teacher's book.

**Words and Phrases for Explanation** (in sample).

- (a) *Who is this, etc.* Personification of the S.W. wind. Explain that the whole piece is personification (if necessary explain personification). Describe the characteristics of the S. wind to the class, and show the appropriate nature of the various descriptions.
- (b) *Clad in a bright, etc.* Referring to the clear sky which generally accompanies this wind.
- (c) *Hot and sultry breath.* A reference to the warmth of this wind. Breath is wind. The simile is good, for a hot breath would indicate a condition of bodily languor.
- (d) *Crystal brook.* Show a crystal, and let the class see how it sparkles. The brook sparkles in the sun like a crystal.
- (e) *Languid limbs.* A reference to the fatiguing effects of the S. wind.

### C. Difficulties of Style.

1. *Punctuation.* The teacher must insist upon the punctuation marks receiving proper attention and proper interpretation. Plenty of correction, pattern work, and explanation will be required.
2. *Emphasis* should be placed on *this, hot, sultry, tanned haymakers and sheep shearers.* Where necessary *accent* must receive attention.
3. *Intelligence.* Where children do not understand what they are reading, style must necessarily be bad. The efficient explanation of IV. (B) will facilitate the necessary understanding.
4. *Voice.* The voice should be nicely pitched with varied cadence. There must be no artificiality, and the pace must not be too fast. Enunciation and articulation must be pure and distinct.

### D. Discipline.

1. Some points of discipline have already been mentioned under the head of introduction. These include the *position of the scholars, the distribution and collection of books, the arrangement of the class.*
2. The *teacher's position* should allow every child to fall within his range of vision.
3. The *room* should be physically comfortable. Noise, glare, and distractions of every kind should be removed.
4. *Each child should have a book.* There should be no "looking over".
5. *Children should not always read in turn.* When inattention is detected or suspected, the offender should immediately be called upon to read.

## HOW TO DEAL WITH ANOMALOUS DIFFICULTIES IN READING.

These may be illustrated by some such passage as the following extract (1879):—

"He would take no pains to teach any boy who could not at least write what boys of eight years old can write".

## Like Sounds and Unlike Spellings.

1. **Would.**—*Wood, hood, good, could*; compare and contrast, and note the silent *l*.

2. **Pains.**—*Panes, canes, reigns, designs, veins, reins*. Compare and contrast again.

3. **Teach.**—The *ea* sound needs attention here. Compare it with *reach, preach, tea, sea*; and contrast with *screech, breech, teeth, see*.

4. **Any.**—Compare with *many* and contrast with *penny*. Call attention to the sounds of *a* and *e*.

5. **Who, What.**—Teacher to pattern the correct sound; class to imitate it. *Phonic drill* should be given on other combinations like—

which	where	while
when	whither	whether
whilst	whom	wheel
white	why	whose

The pronunciation of *who* might then be compared with *do* and *coo*; *what* might be contrasted with *pot, lot, got*.

6. **Write.**—Compare with *rite, mite, spite, kite*, and contrast with *right, height, fight, sleight*.

7. **Eight.**—Compare with *ate, hate, late, plate, slate, skate, mate, pate, bate, rate, date, fate*.

## Like Spellings and Unlike Sounds.

1. **Would.**—*Bould(er), mould*. Here the syllabic combinations are alike, but the sounds are different.

2. **Pains.**—*Mountain, captain*. Contrast with *pains*, and compare *pains* with *dain, maintain, again*.

3. **Teach.**—This word presents no difficulties under this head.

4. **Any.**—Contrast with *litany, Bethany*.

5. **Who, What.**—*Who* might be compared with *whom* and contrasted with *whorl*. *What* will present no difficulties under this head.

6. **Write.**—No difficulty under this head. Practically *ite* is an invariable sound.

7. **Eight.**—Contrast with *sleight* and *height*.

In all these cases *contrast* and *comparison* should be brought into play, and the similarities and differences should be placed side by side on the B.B. The words should be *spelled, written* on slates or paper, *learned, explained* where necessary, and then *dictated*. *Sentences* should then be given containing them, and these should be dictated and read. The class should then be given *sentence composition* on these words.

## QUALITIES OF GOOD READING.

These may roughly be divided into two classes—mechanical and mental. The two classes are not mutually exclusive, but the difference is sufficient to afford a basis for classification.

### I. Mechanical.

1. **Pronunciation.**—*Correct pronunciation depends upon the proper sounding of the vowels*, for there can be no purity of utterance unless they receive their right quantities and powers. Many of our provincialisms are due to incorrect pronunciation of vowels.

2. **Enunciation.**—The aspirate, the *th*, the *r*, the final *g* are difficulties. Various other combinations will suggest themselves, and the student is advised to compose a list for himself. As good pronunciation depends on vowels, so



*good enunciation depends upon the correct sounding of the consonants. Where any pronounced and general defect exists vocal drill should be regularly given for its cure.*

**3. Articulation.**—By articulation is meant *the proper fitting of one syllable on to another*. The derivation of the word (Lat., *artus*, a joint) reveals its meaning. It has a threefold reference :—

- (a) The proper formation of elementary sounds.
- (b) The formation of these sounds into distinct syllables.
- (c) The formation of these syllables into words.

*Bad articulation is often due to faulty enunciation.* Children are slovenly, too quick, careless, and inattentive at times; whereas “in just articulation the words are not hurried over nor melted together; they are neither abridged nor prolonged; they are not swallowed nor are they shot from the mouth; neither are they trailed, and then suffered to drop unfinished; but they are delivered from the lips, as beautiful coins are issued from the mint, deeply and accurately impressed, neatly struck by the proper organs—distinct, sharp, perfectly finished”.

**4. Pitch.**—School children often read too loud, and their voices are just as often pitched too high. There can be no invariable standard for all; but the pitch generally should be that which permits of an easy, audible, unfatiguing production.

**5. Modulation and Tone.**—By modulation is meant *variation in the pitch of the voice*, so as to produce what is sometimes called cadence or tone. The rising and falling inflection gives that change of intonation which makes a voice pleasant to listen to, and facilitates attention. The tone requires to be pleasant and distinct, but not hoisterous or noisy. Where there is no modulation, for the listener there is probably little comfort, and for the reader probably less understanding. These two qualities of reading are difficult to deal with. They are more often gifts than acquisitions, and any drilling in them often produces a stilted and artificial style.

**6. Pace.**—*The subject matter will always determine the pace.* The voice should give a fair translation of the sentiments it is uttering, or the emotions it is revealing. But it should never be fast unless the reader is blessed with a clear and audible production. Drawing is the other extreme, and it is just as bad. Obviously pace is a varying quantity, and may have to change many times in the same chapter.

**7. Accent.**—*This is a superior force of voice or of articulative effort upon some particular syllable of a word distinguishing it from the others.* Sometimes it means more than this when it signifies a peculiar or characteristic modulation or modification of the voice, as when we say a person speaks with a good accent. In poetry it also indicates a slight stress upon a tone to mark its position in the measure. In such cases the accent is regular, and marks the flow of the rhythm.

In *Gill's School Management* a much wider function is claimed for accent. There it is stated that “accent is a stress or bounding of the voice, followed by a slight pause, which groups in pronunciation those words that are so closely combined in sense as to convey but one notion, and to separate which would be to destroy the sense. It also draws attention to that word on which the notion to be conveyed depends. By means of accent phrases are read, not as a succession of words, but as a series of notions, which are in this way made distinct. In fact, accent is the expedient by which every distinct notion is separated and distinguished in reading. In some cases, two phrases are so intimately joined in sense as to form but one compound notion; and at such times two accents are heard, a primary and a secondary—the primary being placed on the word that limits the phrase, or renders it more specific.” If all this can be justly claimed as the work of accent, then it would have to be classed as a mental rather than a mechanical quality.

## II. Mental.

**1. Emphasis.**—By this is meant *the stress of utterance or force of voice given to the words or parts of statements intended to be specially impressed on the listener*. It often removes the accent from its natural or customary position to some other word in the sentence. Its chief effect is to indicate a *contrast*, e.g. :—

*This* is the house that Jack built—this and no other.

This is the *house* that Jack built—as contrasted with other buildings.

This is the house that *Jack* built—as contrasted with other builders.

This is the house that Jack *built*—as contrasted with others he may have bought, etc.

It requires good analytic power, and it is this that makes it a mental attribute of reading; for a proper analysis means a clear understanding. There is a variety of ways of expressing it. The voice may be raised and intensified, or lowered and softened; there may be a sudden change of voice, the use of the pause, or even gesture may be utilised.

**2. Phrasing.**—This involves a proper understanding and translation of punctuation, and something more. Words have to be grouped into notions, and the various relations of these groups of words have to be vocally indicated. Like emphasis, this makes substantial demands on the intelligence, and requires good analytic power.

**3. Fluency.**—Certain *mechanical conditions* are essential for fluency. The type must be good, the light abundant without glare, good eyesight, and a comfortable position. The words have to be readily recognised and easily uttered. There must be no *physical defects*, such as stammering, or faults of habit, such as slurring, stumbling, and miscalling. The eye has to run on in advance of the voice, and the mind has to instantaneously interpret the sense. The words must come naturally. Fluent reading must not be confounded with rapid reading. Reading may be rapid, but incorrect and unintelligent. It may be a mere patter or stilted, and in none of these cases is it fluent. Plenty of practice will be required.

**4. Intelligence.**—If the reading is to be good the child must *understand* what it reads, hence *all the methods of teaching any of the school subjects should be intelligent*. Especially in reading lessons will *suitable matter* have to be chosen, and *suitable explanations* given where necessary. *Exposition lessons* are particularly serviceable for this purpose. If the reading does not put the listener in as good a position as the reader, the reading can hardly be called intelligent. All the qualities of good reading are essential constituents of intelligent reading, and the absence of any one is a defect.

**5. Expression.**—This is the highest quality of good reading. It embraces intelligent reading and something more, for reading may be intelligent without being expressive. *The reader enters into the spirit of the author, and gives it efficient interpretation*. The beauties of the language are presented so as to appeal to the audience. For its successful production it requires a very *sympathetic nature*; a nature that can feel the sentiments and emotions revealed with sufficient reality to give them vitality. It is most difficult to secure; but so far as it can be imparted, it may be done through the aid of suitable subject matter, good pattern work, the cultivation of the vocal powers of the class, by plenty of practice for fluency, by the cultivation of the heart as well as the head, by explanation, and by recitation. Perhaps the recitation of sympathetic pieces will be the best means, but dialogues, extracts from Shakespeare's plays, and kindred pieces, will also be serviceable.

From this list of the qualities of good reading the young teacher will easily be able to enumerate the *chief faults of reading*. He has only to present the converse of each quality, such as bad pronunciation, imperfect articulation, etc., and the short description appended under each head will enable him to recognise the fault and to suggest its cure.

**SILENT READING.**

Silent reading may be practised sometimes, but always under supervision, and *only in the higher classes*, where draft and simultaneous reading are less suitable than in the lower classes. A portion of reading may be mapped out, and the class allowed to read it, but some *oral questioning* should follow. A little *preparatory explanation*, skilfully and pertinently given, would arouse interest and make the exercise more successful. The practice has its *advantages*. The children are taught to cultivate a *love for reading* in this way, and this love may show itself in home reading through the medium of the school or circulating library. The process is *pleasurable*, for they read with little or no restriction; they are continuously occupied; they learn to rely on themselves for grasping the point and meaning of the subject matter; they are not harassed by the many points of discipline incidental to an oral reading lesson; they read with greater physical comfort; they read more than by the oral method; and they become better spellers.

**SIMULTANEOUS READING.**

**I. Description.**—The method and quantity will vary according to the class. Roughly speaking, there are three stages: (a) Words; (b) Phrases; (c) Sentences.

**1. Words.**—The teacher reads a word; the class pronounces it slowly after him, the enunciation being slow and distinct in each case. This process is followed to the end of the sentence. Repetition will probably be necessary. Then the sentence can be read by a few boys individually. A few sentences may be treated in this way, and they will be sufficient for one lesson.

**2. Phrases.**—Here a few words are first read by the teacher, and then repeated by the class, who point to the words as they are read. So far as possible, the teacher will make the phrases notional, and for this purpose the number of words will vary. A short chapter can be treated in this way, and each chapter should be mastered as follows:—

- (a) The teacher reads a *phrase*; the class reads the *next phrase*. This proceeds to the completion of the *first period*.
- (b) The teacher then pattern reads the *sentence*. The class copies simultaneously.
- (c) A few scholars might then be asked to read the sentence *individually*.
- (d) A *whole paragraph* could then be recapitulated by individual reading.
- (e) The *whole chapter* could be thus treated, paragraph by paragraph.

(f) For *variety and emulation* the class might then be divided into two *sections*, each section reading set portions alternately and simultaneously.

(g) The final step should be to read *the whole chapter individually*.

**3. Sentences.**—The pupils are now ready for sentences from their training in the last method. This is the best method:—

(a) The teacher reads a *sentence*, or several sentences, slowly, with good emphasis and expression.

(b) *The children follow simultaneously*, copying the pattern of the teacher. The whole lesson can be treated in this way.

(c) *Sectional emulative simultaneous reading* should follow.

(d) *Individual reading* again should be the final stage.

**II. When Used.**—In the early stages the practice is useless unless the child is following with its eye what it is saying with its voice. This makes pointing a necessity, otherwise the child will repeat from memory, or catch up what the other scholars are repeating. For these reasons it should be used with some moderation in the earliest classes. As soon as the eye can recognise words, then it may be used more generally. It will be used most in the lower classes of the upper departments and in the upper classes of the infant departments. In the higher classes it has its uses, and in the large classes of modern primary schools these uses are important; but the more individual reading a teacher can give to his pupils, the better for the pupils.

Advantages.	Disadvantages.
<ol style="list-style-type: none"> <li>1. It increases the <i>quantity</i> of reading for the class.</li> <li>2. It increases the command over the organs of voice, and so facilitates <i>fluency</i>.</li> <li>3. It improves <i>pronunciation, enunciation, and articulation</i> if carefully taught. Each has to go the same pace, and each is encouraged under cover of his class-fellows' voices to greater vocal effort.</li> <li>4. The <i>pitch</i> of the voice is regulated, and <i>modulation</i> is learned, whilst common faults of <i>intonation</i> are cured.</li> <li>5. It improves the <i>pace</i> of the reading, stimulating the slow and checking the fast.</li> <li>6. It modifies individual <i>mannerisms</i>.</li> <li>7. It improves the <i>intelligence</i> in some cases, especially when dove-tailed with individual reading. From the pattern reading of the teacher, and from the example and influence of the better readers, more expression is given, and the sense of the subject matter is better grasped.</li> </ol>	<ol style="list-style-type: none"> <li>1. It is uncertain whether the reader follows with his eye the words he repeats after the teacher.</li> <li>2. Children, from too much repetition, get to repeat from memory, and it has often been found that they can proceed with the lesson without the aid of the book.</li> <li>3. It may, in the hands of a poor, lazy, or careless teacher, encourage idleness, and even deception.</li> <li>4. Unless taught with care it may produce <i>inaccuracy</i> and <i>indistinctness</i>, and accentuate the vocal faults it is well fitted to cure.</li> </ol>

**BACKWARD READERS.**

The treatment of backward readers is a difficulty common to all schools. They require special attention, and should receive it both during, before, and after the lesson. The treatment will depend upon the cause, which may be the result of inaptitude or general dulness.

**I. Inaptitude.**—The poor reading may be simply a special case of inaptitude through bad or neglected teaching, or through relative dislike, owing to a strong preference for other subjects. Where special aptitudes exist, the teacher should take advantage of these to improve the reading. A pupil may excel at some other subject, although he may read and spell badly. The treatment is easy here. Time can well be spared from the strong subject for the weak one, and thus more practice will be obtained. The difficulties lie chiefly with word naming.

**II. General Dulness.**—Special treatment will be required in these cases.

**1. Before the Lesson.**

- (a) The backward scholars can be taught some of the more difficult words, which can be *written on the B.B. and learnt*. The words should be *briefly explained* where necessary, as they then become intelligent pictures to the children. The better readers could be employed at some other subject.
- (b) A list of the hardest or strangest words could have been given them *the night before* to learn, the teacher having previously pronounced each word carefully with the class.
- (c) Where *parental co-operation* is assured, the boys might be permitted to take home the reading book for the purpose of reading the chapter through. Where home help is forthcoming this assistance would be valuable. But, as a rule, this can only be done in better-class schools—generally where it is least wanted—and even there it will be found expensive, and at times not over thorough.
- (d) *Transcription, dictation, or composition* may be used before the reading lesson, to make them familiar with the chief mechanical difficulties.

**2. During the Lesson.**

- (a) Bad readers should be well under the teacher's eye, so that he may *super-vise them well*; and he should see that they point and follow carefully all that is read.
- (b) A good reader, as a rule, should follow the pattern reading of the teacher. *It breeds confidence in the boys*, for the gulf between boy and boy is less than that between teacher and boy. A backward reader should then follow. He should read the piece through twice—thrice, if necessary—but he must read it perfectly before he finishes.
- (c) The weaker readers, being grouped together, might read a portion *simultaneously* after the teacher, and then simultaneously without the teacher, to be followed by one or two individual readers.

**3. After the Lesson.**

- (a) As word naming is the chief difficulty of the backward readers *the*

*teacher might pursue the same course as before the lesson.* His list of words will now have decreased, and a few minutes ought now to be sufficient.

- (b) Where home work is taken, the class might be asked to reproduce the substance of the chapter as an exercise in *composition*, or the composition might be done in school.
- (c) A *dictation lesson* might be given embodying the chief difficult words which ought to have been previously prepared and learned.
- (d) The class might do some *transcription* from the more difficult portions of the chapter, and learn the words as they write them.

Remember, it is unwise, as a rule, to place an older scholar in a lower class, however backward he may be. His feelings are hurt; he is probably thrown into a strong emotional state, which is most unfavourable to intellectual progress; and a hatred for the subject will be engendered, because his sympathies and tastes are probably not those of his class-fellows.

## READING BOOKS.

**I. Their Qualities.**—Great care should be exercised in the choice of reading books, as they bear largely upon the character of the reading of the school. A book should never be rejected because it contains a few more pages than another, or a larger proportion of harder words. Such books are not always the most difficult to read or to teach. No book should be selected which does not embrace all the following principles:—

- 1. It must be *well printed* and *attractive*, and calculated to give pleasure.
- 2. It should impart some *knowledge*, and it should not be too childish or silly. A book can be humorous without either of these attributes.
- 3. It should be written in *English*, and not in the gibberish found in some early reading books.
- 4. It must be able to maintain *interest*. To do this consecutive stories are perhaps the best for young scholars. *Curiosity* and the *interest of pursuit* are great in this respect in young children. Short and scrappy pieces should be avoided; as they kill interest. The so-called "Educative" books are rarely a success as reading books, and if information be given at all it must be suitable in style.
- 5. The book must be *progressive*. Every lesson should contain a few new words, slightly increasing in difficulty.
- 6. The subject matter should aim to cultivate the *affections* and *moral feelings*, without obtruding the moral of the story. The moral can be wrapped up in the story, and so become more effective.

**II. Variety.**—There should always be more than one set of reading books to a class, as the pleasure of reading is destroyed by the monotony resulting from a limited supply. The affections and moral feelings are deadened by the endless repetition of the same lesson, which thus becomes a mere mechanical exercise, and nauseates the pupils. But little knowledge can be imparted, and no love of reading can be implanted, or good spelling outside such books be expected, or much intelligence be displayed, where the reading matter is foolishly too limited. It has been demonstrated repeatedly that those schools read best which do not con-

vert the minimum laid down in the Code into a maximum. Remember that one of the great aims of the teaching is to implant a love for the subject in the pupils, which is best attained by plenty and variety in the reading books.

### III. Reading Books in Class Subjects.

**1. Where the Class Subjects are Taught.**—Geographical, historical, and elementary science reading books are valuable instruments of instruction in these subjects. The books should be used in all standards above the second. It is optional whether they are used in the first two standards; but where the books are suitable it is desirable. The *best* reading books for the higher standards are those which—

- (1) Are *descriptive and explanatory*.
- (2) Are *suitably illustrated*.
- (3) Contain *sufficient, varied, and interesting* matter.

It is not necessary that the lessons in the reading book should cover the whole area of the course of instruction adopted for the class subject. It is presumed that the teaching in such a subject will be mainly oral.

The chief *uses* of the reading book are:—

1. To give greater *definiteness* to the teaching.
2. To make thorough *recapitulation* easier and more effective.
3. To invest the subject with new *interest*.

—(Revised instructions to H.M. Inspectors.)

**2. Where the Subjects are not Taught.**—Here the books will require to be chosen with great care, and they should possess all the following characteristics:—

- (a) The subject matter must be *varied* and *suitable* to each standard.
- (b) The matter must be *interesting*; *suggestive* rather than *exhaustive*.
- (c) The facts and ideas should be expressed in *language* suited to the abilities of the children.
- (d) The book should be well and *suitably illustrated*.
- (e) The lessons should be suitable in *length*.
- (f) The book should be written on some *definite plan*; e.g., simple stories for an early standard; biographies for another, and so on.
- (g) *Technical terms* should be avoided in all but the highest standards; and English equivalents should be found for them.
- (h) The teaching, so far as set forth in the subject matter, should be *objective* and *experimental*, and a proper use should be made of maps, pictures, charts, and diagrams.
- (i) There should be no *cram* elements about the book. Long lists of names, tables, and tabulations should be omitted. It must always be remembered that the books are reading books.
- (j) *Difficult words* and ideas should be dealt with as in an ordinary reading lesson.

If these suggestions are practically heeded, the books will be found a valuable adjunct to the school education. The aim should

be to quicken the intelligence by a revelation of the interest of common things, places, and the incidents of everyday life. If the reading be attractive, a *taste* for further reading will have been given, and this is far more valuable than mere information which a tenacious memory may retain from the books. The spirit of inquiry, the thirst for knowledge, the widening of the interest, and consequently the increase in the pleasurable and useful potentialities of the pupils, will be a result which, although probably small in evidence, ought yet to gratify the teacher as the best success that can attend his efforts.

### **Fairy Tales as Reading Matter.**

Should these fairy tales form part of the literature of our school children? There is a conflict of opinion on the subject; and arguments *pro* and *con* have been advanced, but the weight of argument seems to be in their favour.

#### **I. For.**

**1. Pleasure.**—They are *undoubted sources of pleasure*, and largely help to increase the sum total of child happiness, for they carry children into regions where pure and unadulterated happiness is supreme. They also afford a *stock of pleasant memories*.

**2. Education.**—*They breed a love for reading*, and for this reason are worthy of retention. They also cultivate the *imagination*.

**3. Morality.**—They are emotional in their effects, and exercise an influence on the hearts and dispositions of the children. *Every good fairy tale has an ethical purport*. It helps to solve the problems of life by exciting sympathy with the good and disgust with the bad. Whatever (if anything) can be said against the fairy tale in this respect, can be said at least with equal force against the novel, the romance, and the stage. In fact, it is an attractive way of teaching virtue without unduly obtruding the moral on the children.

**4. Faith.**—They teach the children to believe in friendly, though invisible, forces. The "guardian angel" becomes almost a reality to them, and a mental attitude is formed favourable to the reception of great religious truths, which rest on faith as their foundation.

**5. Hope.**—They help the young soul with its hopes and its desires to expand, and to aim at a *high ideal*. They lead to a hope for a happiness unknown in real life, but which nevertheless exists, because it is experienced under the spell of a fairy tale.

#### **II. Against.**

**1. Imagination.**—They are said to pervert and harm the imagination, being the creatures of unbridled imaginations themselves. The difficulty in training the imagination is to regulate it whilst stimulating its growth.

**2. Unreality.**—They give children false ideas of real life, and so unfit them for their struggle with a matter-of-fact world. They breed folly in weak minds, and awaken longings which can never be gratified, and so produce a state of chronic unrest.

**3. Bias.**—The wicked uncle, the unkind stepmother, and the well-specified characters of fairy life, often transmit a strong bias against their supposed prototypes in real life.



**4. Superfluous.**—We now have a rich literature, actually and potentially, and whatever might have been said in their favour in early days is of much less value now.

**5. Superstition.**—They appeared in a more ignorant and a more superstitious age than the present. They were written for a superstitious people, and were based on superstition, and are therefore very unsuitable for the present enlightened age.

## RECITATION.

Recitation is a great aid to a good vocal delivery and intelligent reading. Here the mechanical difficulties are at a minimum, and almost the whole attention can be concentrated on the intelligent rendering of the passage. Really good reading is not the gift of the many, for it makes considerable physical and mental demands upon pupils. Those demands can be partly met, with the assistance of other aids, by good practice in recitation, which assists in developing the requisite qualities.

### I. Physical Qualities.

- (a) **Confidence.**—Many pupils are afraid of their own voices when reciting, or they are ignorant of their own capabilities. Recitation removes the one and reveals the other where it exists. From reciting in chorus the pupil gains sufficient confidence to recite alone.
- (b) **Vocal Delivery.**—A thorough control of the vocal organs is required for good recitation, and practice will help to give this. Clearness, distinctness, well-pitched tone, with good articulation and varying cadence, are absolutely essential qualities of the voice for creditable work of this kind.
- (c) **Strength.**—Exercise strengthens faculty. A weak, piping voice, a bull-throated larynx—both are obstacles. The one needs strength to develop it, the other practice to restrain it. Varying demands are often made upon the physical capabilities in rendering recitation in the higher classes; the range may vary, from the impassioned utterance to the gentlest whisper.

### II. Mental Qualities.

- (a) **Intelligence.**—The pupil may be drilled to repeat certain sounds at a certain pitch, but if there is no intelligence the audience is soon aware of the fact. The pupil must understand what he is saying, and he must give expression to that understanding by voice (and gesture sometimes).
- (b) **Soul.**—It is a fine means for cultivating the soul or finer feelings. It is an antidote to that metallic vocalism which chills. Teach the pupils to enter into the feelings, the sentiments of the piece, and to translate those feelings into their voices. All this can be done by recitation, for the amount is limited, and there is time for plenty of explanation, pattern work, and repetition. The correct rendering of the piece by the teacher throws a flood of light upon the sentiments expressed in the extract.

### III. Advantages.

—These are not confined to reading only.

- (a) It improves the **taste** by forming acquaintance with the choice portions of some of our choice authors.

(b) It cultivates the **imagination**, for poetry is a great field for imagination. The power of picturing what has never been seen but only described is of the utmost value to education.

As the fancy often requires restraining it must be **guided**, and this is one of the methods of doing it. In other cases it requires stimulating; but in all cases the natural laws of its operation must be followed. For this purpose the pieces selected for recitation should be graded.

(c) It widens the scholar's mind by giving him new thoughts.

(d) It improves the power of **composition** by giving him the best models for imitation, and by storing specimens in his memory.

(e) It has already been shown to improve the style of the **reading**.

#### IV. Pieces Suitable for Recitation.

Standard.	Title of Piece.	Author's Name.	No. of Lines.
I.	The Loss of the <i>Royal George</i> - - - - -	Cowper.	36
	The Soldier's Dream - - - - -	Campbell.	24
	The Death of the Flowers - - - - -	Bryant.	30
	I Remember, I Remember - - - - -	Hood.	32
	The Voice of Spring - - - - -	Howitt.	24
	The Child's First Grief - - - - -	Hemans.	28
II.	The Shepherd in Winter - - - - -	Scott.	43
	Casabianca - - - - -	Hemans.	40
	Dickens in Camp - - - - -	Bret Harte.	40
	Bruce and the Spider - - - - -	Cook.	44
	Lord Ullin's Daughter - - - - -	Campbell.	56
	Hector and Andromache - - - - -	Pope.	54
III.	The Cloud - - - - -	Shelley.	66
	We are Seven - - - - -	Wordsworth.	65
	Ode to the North-East Wind - - - - -	C. Kingsley.	68
	Lucy Gray - - - - -	Wordsworth.	64
	The Battle of Blenheim - - - - -	Southey.	66
	Ye Mariners of England - - - - -	Campbell.	64
IV.	Brave Lord Willoughby - - - - -	Old Ballad.	88
	The Night before Waterloo - - - - -	Byron.	84
	To a Skylark - - - - -	Shelley.	94
	The Wreck of the <i>Hesperus</i> - - - - -	Longfellow.	88
	The Shipwreck - - - - -	Byron.	84
	The Slave's Dream - - - - -	Longfellow.	80
V.	The Battle of Agincourt - - - - -	Drayton.	120
	Horatius - - - - -	Macaulay.	103
	On the Receipt of my Mother's Picture - - - - -	Cowper.	121
	Ode on a Distant Prospect of Eton College - - - - -	Gray.	100
	Elegy Written in a Country Churchyard - - - - -	Gray.	128
	Nanhaught the Deacon - - - - -	Whittier.	107
VI. and VII.	L'Allegro - - - - -	Milton.	152
	Il Penseroso - - - - -	Milton.	176
	Mark Antony's Speech - - - - -	Shakespeare.	156
	Brutus and Cassius - - - - -	Shakespeare.	151
	Hubert and Arthur - - - - -	Shakespeare.	150
	Henry VIII.—Fall of Wolsey - - - - -	Shakespeare.	154

## EXAMINATION QUESTIONS.

1.—What is meant by *simultaneous* reading? How should it be conducted, and what is the use of it?

2.—What is meant by *tone, accent, emphasis, and expression* in reading? Say why they need special attention, and how you can best deal with them.

3.—Say what sort of reading lessons you have found most interesting to young children, and describe the way in which you would try to secure *distinct articulation*.

4.—Name a few words which are specially difficult for young children to read owing to the presence of *silent* letters.

5.—What is meant by *distinct articulation* in reading? Name any words which present special difficulty to learners, and mention any form of exercise that is most useful in correcting faulty articulation.

6.—Explain the use which a teacher should make of *simultaneous* and of *pattern* reading, and say what objection (if any) there is to an excessive use of either method.

7.—In teaching the elements of reading to young children, say whether it is better to begin with little words and afterwards call attention to the letters, or to begin with the alphabet and afterwards make up simple words. Give your reasons.

8.—Give explanations (brief) of any difficulties in the following passage, proposed as a reading lesson to scholars in the Second Standard:—

"Who is this that cometh from the south, thinly clad in a light transparent garment? Her breath is hot and sultry; she seeks the refreshment of the cool shade; she seeks the crystal brook to bathe her languid limbs. The tanned hay-makers welcome her coming, and the sheep-shearer, who clips the fleeces of his flock with his sounding shears."

9.—What are the chief difficulties to be encountered in teaching infants to read? Detail the apparatus required for children below seven years of age.

10.—Detail some of the advantages and disadvantages of teaching reading by the alphabetic method.

11.—Write out some sentences containing five or six words which would present difficulties to each of the three lowest standards, and explain the progressive character of your method.

12.—What preparation should be made by a young pupil teacher before giving a reading lesson to a lower class, both as regards the language and the matter of the lesson?

13.—In the following sentence explain the peculiar difficulties presented by the words in *italics* in the early stages of reading:—

"He would take no *pains* to teach any boy who could not at least write what boys of *eight* years old can write."

14.—What especial care would you bestow upon the less advanced readers in your class before, during, or after a reading lesson? How can home lessons be utilised for teaching reading?

15.—What should be the next steps in reading after a child has mastered the forms of the letters and powers of the vowels? Give examples of a few such lessons.

16.—Explain how the reading of dialogue and recitation may be employed to remedy want of intelligence in reading. For what reasons should more than one set of reading books be employed in each class?

17.—Which subjects of instruction can be best taught by reading books, and which by oral lessons? Give reasons in each case for your classification.

18.—Name some of the qualities of good reading.

19.—What special help should be given to an older child backward in reading, to obviate his being placed in a class of younger children? What harm would it do a child to be so placed?

20.—Give some rules which you intend to follow for securing (1) *distinct articulation*; (2) *intelligent expression* in reading.

21.—What are the commonest faults which you have found in the reading of children? How would you correct these faults?

22.—It is sometimes complained that children do not read well because their reading lessons are constantly interrupted by the oral spelling of the more difficult words. Do you consider such interruption necessary, and, if not, how may good spelling be attained without it?

23.—Explain what may be done by the help of reading books to impart geographical and historical information in schools in which geography and history are not taken as class subjects.

24.—Name some poetical pieces or extracts suited for recitation in any three of the classes, either in an infant school or in a school of older children, and say what is the use of memory exercises of this kind.

25.—What is meant by *style and expression* in reading, and how can they best be taught?

26.—What is the best way of arranging a class for a reading lesson so as to secure (a) *distinctness of utterance*, and (b) *readiness on the part of the scholars to observe and correct mistakes*?

27.—It is said that some children know their reading books almost by heart, and that when examined they are only reciting, not reading. How could you detect this fault, and by what means could you guard against it?

28.—What is the use of pattern reading in teaching a class to read? Mention any common faults which a good teacher should avoid in giving such lessons.

29.—Explain what is the best use to make of a box of movable letters in an infant class.

30.—Describe a plan followed in your school in beginning to teach the youngest children to read.

31.—Point out the silent letters in "light," "height," "which," "colour," "tremble".

32.—What are the advantages and disadvantages of simultaneous reading, and when and how should the practice be adopted?

33.—What are the chief points to be kept in view in teaching the art of reading? Name the advantages, if any, of exercises in silent reading in school.

*This Chapter is continued in the Appendix.*

## CHAPTER X.

## SPELLING.

SPELLING is one of the most difficult branches of school education. Children learn to spell correctly with difficulty, and forget what they have learnt with ease; they spend years in acquiring, and little more than weeks in forgetting. Some never spell correctly at all; and absolutely correct spelling is anything but a general accomplishment, even among educated people. The subject is one mass of anomalies, and the national waste in acquiring such a system is beyond computation. In company with our cumbrous system of compound rules in arithmetic, it handicaps our youth heavily in the educational race, and prevents very valuable time being spent in a much more productive manner. Attempts have been made to introduce systems of phonetic spelling, but with no success at present. The spread of phonography or shorthand may yet have a big influence in modifying our spelling into something easier, especially if it should ever become generally taught. The objections to change rest on mighty bases which will require much to move them. The habits of the people, their reluctance to face the labour of a change, the opposition of the printing trade, the great loss of capital involved, and the destruction of the historic evidence contained on the faces of the words themselves, will always be obstacles to change, however desirable some may think it. In a language so arbitrary as ours, spelling must always be a difficulty, hence the teacher needs to study the best ways and means of teaching the subject.

**Ways of Teaching Spelling.****1. The Reading Lesson.**

- (a) Spelling is a matter for the *eye*. Reading gives plenty of practice to the eye, and the recurrence of word pictures fixes them in the memory through the eye.
- (b) *Formal spelling* forms a part of many reading lessons. The *eye*, the *ear*, and the *voice* all unite to fix word impressions,

**2. Lists of Words.**—These are sometimes given as home work. The words are generally selected from the school reading books, and this method has practically supplanted the use of the old spelling book. The *meaning* should always be given, as it brings *intelligence* and *interest* to bear on the work. The old spelling books were often published with meanings, but as explanation was the exception probably, and not the rule, the meanings were of little use, often being mere synonyms or being expressed in language as obscure or meaningless as the word itself. The words should be *grouped* (and this could be done in several ways), which would bring *variety*—another essential for interest; *e.g.* :—

1. Like combinations and unlike sounds }
2. Like sounds and unlike combinations } Irregular.
3. Like sounds and like combinations—Regular or phonetic.

As an example, take the words **rough, should, which, many.**

**Rough.**—This word is made the basis for grouping a large number of words, to which the principles of **comparison** and **contrast** are applied; *e.g.* :—

**Rough** is compared with Tough, ruff, puff, buff, stuff, etc.

„ *contrasted* „ Cough, off, north, broth, etc.  
 „ „ Dough, although, low, know, etc.  
 „ „ Bough, plough, sough, cow, etc.  
 „ „ Through, hew, knew, hue, Jew, etc.

**Should** is compared with Could, would, wood, hood, good, etc.

„ *contrasted* „ Boulder, moulder, ghoul, soul, etc.

**Which** is compared with Witch, rich, ditch, hitch, pitch, etc.

„ *contrasted* „ Greenwich, Woolwich.

**Many** is compared with Any, penny, jenny, fenny.

„ *contrasted* „ Company, manifold, manly.

**3. Transcription.**—See notes on Transcription.

**4. Dictation.**—See notes on Dictation.

**5. Formal Spelling Lessons.**—These are still given in some schools. They are profitable, for they admit of *graded* systematic teaching. Generally, however, they are preliminaries to some other lesson like reading or dictation. The teacher's chief task for success is to make such lessons interesting, and this must be done by classification, suitable explanation, mark giving or place taking, and by a bright, sympathetic manner in questioning.

**6. General Work.**—Spelling enters into most of the general work of the school. It is a chronic difficulty, and requires continuous teaching and practice. Whenever and wherever a spelling error occurs, as a rule, then and there it should be corrected.

**7. Composition.**—This affords a good test of spelling, which is generally worse in composition than in other lessons. The divided attention demanded by the subject probably accounts for this. *Word building* is a good exercise, both for spelling, composition, and grammar. A sample syllabic combination can be taken, and words can be built from it; *e.g.* :—

-at	c-at	sc-at	sc-at-ter	scat-ter-ed
-at	p-at	sp-at	sp-at-u	sp-at-u-la
not	-with	-stand	-ing	
nev	-er	-the	-less, and so on.	

**8. Observation.**—Childish curiosity and activity show themselves in the reading of miscellaneous matter like shop names and advertisements. Encourage it, for it is a good aid.

**9. Literature.**—Easy story books, fables, and childish literature generally are more or less now within the reach of most children, and the reading of these aids spelling. School libraries assist older scholars, but they make no provision for younger scholars.

**10. Spelling Contests.**—These were in great fashion as “Spelling Bees” a few years since; and although they have dropped out of public favour, there is no reason why they should not be maintained in the school. They stimulate emulation and effort, and that desire for success which can only be obtained by constant preparation.

### Faults in the Teaching of Spelling.

1. The *ear* and the *tongue* are appealed to rather than the *eye*. Both should be used, but there should be *observation* as well as *repetition*. The deaf and dumb generally spell correctly, and this is some evidence as to the value of the eye. Then the *visual or pictorial memory* is stronger in most people than the *verbal*, hence the eye should be used more than the tongue and the ear. Spelling is essentially a matter for the eye, for, after all, it is nothing more nor less than the mastery of form; but the tongue and the ear can be brought in as aids to strengthen the associative links.
2. *Lists of disconnected isolated words* are given to be learnt, whereas they should be chosen from lessons done or to be done.
3. The number of syllables is generally the only basis of *classification*. This is not scientific. The words should be grouped, and plenty of use made of contrast and comparison.
4. The *meanings* of words should always be given, not in set definitions, but in suitable explanation, so that each word may as far as possible become notional to the class. The meanings, when required, are too often overlooked or neglected.
5. Dictation should always be prepared in the lower classes, so that the right form may be first learned, and then there will be nothing to unlearn. *Teachers are often too anxious to test by dictation before they have prepared by spelling or transcription.*
6. More use should be made of *composition* exercises. It has already been pointed out that spelling is often worse in composition than in other spelling exercises, and it generally reveals many of the special weaknesses of each pupil. The teacher then knows where to concentrate his work.
7. There should be lessons in *word building*. It is a good phonetic and synthetic exercise, and it gives confidence to the children, and so helps to check that demoralisation which often attacks young scholars when they are undergoing repeated shocks of spelling anomalies.
8. There is often an absence of *incidental aids* like phrase spelling, classified spellings, and spelling bees. All of these have their use and their value, and they should not be neglected.
9. Spellings are sometimes taught at the *wrong time*, although such times must be very rare. But to obtrude the spelling of a word when the class is deeply interested in some experiment, illustration, or description, is to attempt the right thing at the wrong time.

### Difficulties in Spelling.

Our anomalous and defective alphabet is the chief source of these difficulties. Mr. Gill in his *School Method* emphasises this fact by showing that ten selected letters have thirty-eight sounds, and furthermore that seventeen sounds have ninety-eight different ways of representing them. These are the difficulties of beginners.

**I. Higher Classes.**—The thorough and successful teacher will always make sufficient preparation for all lessons where preparation is necessary; and so in spelling preparatory observations should be made as to its difficulties before proceeding to write from dictation. The words must not only be learnt, but the difficulties as they exist in each word must be pointed out and

compared with similar syllables and similar sounds. These difficulties, from their very nature, need *frequent* rather than *prolonged* attention. Spelling is a memory exercise, so that there must be repetition, concentration, and interest, for without these memory is weak. To make a spelling lesson interesting requires some skill and preparation. Furthermore, the class should thoroughly understand the piece; hence, where necessary, words should be explained. The following fragment might be taken as an example:—

## II. Preparation for Class.

**A. Subject Matter.**—"The *watery dykes* display *luxuriant verdure*; *bulrushes* and *waterflags* have attained their freshness; willows are rich with *foliage* in *sylvan* nooks; *agreeably* hidden in a *leafy arbour* you may catch glimpses of the retiring *denizens* of the more secluded *labyrinths* of the forests" (1883).

1. Have the piece *read simultaneously*, and then by several scholars individually, either from the B. B. or books.
2. *Underline the difficult words* after having written the piece on the B. B. The piece should have been, previous to the lesson, already written on the B. B. -
3. Now *group* the words as far as possible, and deal with them both as to spelling and meaning *seriatim*.

## B. Words.

1. **Watery, agreeably, leafy.** Note the *y* sound in each word, -y, -ly, -y. Compare with -ic, -ey, -ee, -ea, -i (*foliage*). Explain the words, and then have them learnt.
2. **Luxuriant, bulrushes, secluded.** Call attention to the different sounds of the -u. Explain words, and have them learnt. Previously a specimen or picture of a bulrush might have been shown. *Bul* (syllable) should be compared with *bull* (a complete word). *Se* might be compared with *sea*, *see*, -*cei*.
3. **Sylvan, dykes, labyrinth.** Note the *y* sound again, and contrast with *i*. Explain the words, and have them learnt. Sketch or show a picture of a *dyke*. *Derivations* may be given in many cases to an advanced class, especially if they throw any light upon the history of the words and their changes of meanings.
4. **Attained.** Compare pain, gain, Cain, lain, drain, stain, etc. Contrast mane, pane, rein, reign, deign, bane, etc.
5. **Denizens.** A phonetic word. Explain the meaning, and have the spelling learnt.
6. The words might now be rapidly recapitulated in their spelling, and the class will then be ready for the dictation or reading.

**III. Lower Classes.**—With younger children the method pursued should be somewhat different. Take the following piece for children in the Second Standard:—

**A. Subject Matter.**—"The *tiger's tongue* is so *rough* that if it were to lick your hand it *would cause blood to flow*; its *colour* is a



light *tawny brown* with *beautiful* black stripes; its feet are *cushioned*, and it has *whiskers* to help it feel its way" (1880).

### B. Words.

1. **Tiger's.** Here the apostrophe is the difficulty. Show that it denotes possession; convert to "the tongue of the tiger"; note that it is singular, and contrast with the plural form (tigers').
2. **Tongue.** The letters *ue* are silent; the *o* has a *u* sound, hence the word is pronounced *tung*. Compare with *rung*, *sung*, *hung*, *bung*, *dung*.
3. **Rough.** The most tiresome syllable in the English language. See "Ways of Teaching Spelling".
4. **Would.** Compare with *could* and *should*—silent *l*; and contrast with *wood*, *hood*, *good*.
5. **Blood.** The *-oo* has the sound of *u* (= blüd). Contrast with *hood*, *wood*, *good*; and compare with *mud*, *stud*, *spud*.
6. **Flow and brown.** Note the difference of the *-ow* sound in the two words. Compare *flow* with *know*, *sow*, *stow*, *throw*, etc., and *brown* with *cow*, *row*, *now*.
7. **Colour.** Silent *u*. Compare with *parlour*, *governour*, *labour*; explain that these words are now sometimes spelt without the *u*, as in *color*, *labor*.
8. **Tawny.** Compare *tawn-y* with *lawn*, *pawn*, *dawn*, and contrast with *turn*, *corn*, *morn*, *for-lorn*.
9. **Beautiful.** Explain *beau*, and have it spelled. Point out the difference in spelling between *full* (word) and *ful* (suffix).
10. **Cushioned.** Its length, strangeness, the *i*, and the pronunciation would constitute its difficulties here. The first part of the word could be compared with *push*, and contrasted with *lush* and *rush*. But the meaning having been given, repetition and writing will be the best means of learning this word.
11. **Whiskers.** The O.E. *wh* (*hw*) is the difficulty here probably. The regular observance of the proper pronunciation of *who*, *which*, *what*, *when*, *where*, and *why* would make this difficulty easy.
12. Finally the words should be written on the B.B.; the class should be allowed to learn them, and subsequently they should be dictated in the piece of composition to which they belong. The errors (if any) should then be dealt with and learned.

### The Classification of Difficult Words.

The *Teachers' Monthly* in the November number of 1893 contained the following list of 200 words (which were adjudged the best of a number of lists submitted) as being typical of the errors that are most likely to occur in the dictation exercises of Standard III. The list was furnished by Mr. Mitchell, Schoolhouse, Ferry-side, Carmarthenshire, and the classification is a very good one.

#### I. Tendency to omit letters.

beginning	beautiful	wool/en	address	shepherd
safety	kingdom	slippery	compelled	agreeable
success	swimming	biggest	hottest	except
carriage	ascend	generally	opposite	immediate
marriage	descend	stretching	possess	whiteness
traveller	disappoint	fourth	temptation	quarrelling
account	government	forgetting	likeness	forgiveness
difficult	addition	thinner	safely	redder
convenient	occasion	daisies	particular	occurred
pleasant	useful	surprised	accustom	suppose
afford	jealous	really	getting	dessert

**II. Tendency to insert letters not required.**

bur(t)ied	until()	tig(t)ress	wel(t)come	lin(t)en
wis(t)dom	wood(t)en	al(t)most	pas(t)time	nec(t)essary
sub(t)raction	hund(t)reds	umb(t)rella()	gri(c)tious	deli(t)ver
quarrel(s)ome	oblig(t)ing	im(t)age	per(t)il	ful(t)fil()
wel(t)fare	mis(t)aken	im(t)agine	tres(t)pass	skil(t)ful()
al(t)ways	travel()	ex(t)ercise	shin(t)ing	pre(t)sently
drown(t)ed	tru(t)ly	al(t)ready	bal(t)ance	us(t)ing

**III. Tendency to mistake vowels.**

business	grammar	separate	divide	pursue
governor	cotton	standard	visible	surface
purchase	doctor	system	scholar	persuade
sensible	basin	leisure	destroy	figures
sailor	sugar	manners	different	regular

**IV. Tendency to mistake consonants.**

nephew	medicine	clothes	picture	{ profit
monarch	duchess	conceal	expense	{ prophet
anchor	accident	grocer	physic	{ practise
certainly	accept	chimney	razor	{ practice

**V. Tendency to reverse order (el, le, ol).**

believe	pieces	receive	violent	mischief
relieve	siege	conceive	violet	grief
niece	seize	thieves	friendship	fieri
series				

**VI. Silent letters.**

knowledge	neighbour	knitting	cupboard	solemn
ploughing	unwholesome	scenery	knocking	autumn
islet	climbing	roughly	doubtfully	column
foreign	answer	wrought	kiln	tombstone
indebted	sovereign	naughty	although	dough

**VII. Miscellaneous.**

{ current	{ course	{ whether	{ rowed	advise
{ current	{ coarse	{ weather	{ rode	advice
fatigue	view	{ wether	{ road	error
plateau	colonel	scythe	stomach	patience
tight	wreck		des(c)rt	valleys

**Rules for Spelling.**

If the teacher should decide to give formal spelling lessons in school, or to supply lists of words for home work, he might make use of the rules of spelling which have been ably formed by Professor Meiklejohn in his new spelling book. In such cases the rule should first be learned inductively. Plenty of examples should be given, and from these the rule should be discovered and given. Then the lists of words might be committed to memory. But there are two primary objections to such lessons. Spelling is usually learned as a preparation for some other lesson, and the choice of words will necessarily be limited by the subject matter of that lesson. This would necessitate the introduction of a number of strange (to the lesson) words for the purpose of discovering the rule, or the rules will only be capable of partial application; and, secondly, the number of exceptions is so large as to make the total result sometimes confusing. Perhaps the

best way to solve the difficulty would be to have a number of formal spelling lessons, and then in such cases as preparation for dictation, or in the correction of spelling errors, each case could be brought under its own rule at once. That is, for the correction of errors, the rule should be applied deductively. One or two rules are given here as types, but the student could form others for himself, or he could get a copy of the book referred to, where he will find all that he wants.

1. When the vowels *ei* and *ie* have the sound of *ee*, *ei* follows *c*, but *ie* all other consonants.

When *e* and *i*, or *i* and *e* are sounded like the *e* in *me*.  
After all consonants but *c* the *i* must go before the *e*.

*Exceptions: financier, plebeian, seize, weird.*

If the diphthong has any other sound than *ee*, the order of the letters is always *ei*.

2. A final *y* is changed into *i* when a syllable is added, unless—

(a) The affix begins with *i*, as *ing*, *ish*, *ist*.

(b) The *y* is preceded by a vowel.

*Exceptions: dryness, shyness, etc.; shyly, daily, gaiety, gaily, laid, plaid, said, slain.*

3. The final *e* of a word is retained when a syllable beginning with a consonant is added, but dropped if the affix begins with a vowel.

*Exceptions: abridgment, acknowledgment, argument, awful, duly, judgment, lodgment, truly, wholly, woful, etc.*

## Transcription.

### I. Its Functions.

1. **To Teach Spelling.** This is its primary function, and it does it in a natural way—through the eye. If followed by spelling orally and dictation, the words become permanently fixed.
2. **Practice in Writing.** Care and attention can be given to the writing, although this is a subordinate object of the lesson.
3. **Style.** If the pieces are well chosen, some of the pupils may be gradually leavened with the style of the author; but it is feared that, as a rule, the exercise becomes too mechanical to have much influence of that kind.
4. **Grammar.** The frequent transcription of correct forms of speech tends to the use of correct language, and this, too, in an easy way.
5. **Punctuation.** What has been said of grammar is equally true of punctuation, which is always a difficulty with scholars.
6. **Discipline.** It engenders habits of carefulness, for it demands minute inspection for accuracy, and for this reason it is not an easy exercise. Furthermore, the sentiments expressed in the subject matter, and slowly transcribed by the pupil, have better opportunities (from their brevity, and the comparative leisure offered for their comprehension) of fixing themselves in the minds of the scholars.

### II. Its Conditions.

1. The *subject matter* must be understood by the children.
2. All *errors* must be carefully corrected, and the corrections learned.
3. The *time* for the lesson will vary. In the lower classes it should follow a reading lesson, in which the subject matter has been read and explained. In the higher classes it can be used with more freedom. Its best use will be as a preparation for dictation.

**III. Subject Matter.**—In the early stages, the pieces will be chosen principally with a view to the maximum advantages in spelling, and with a due regard to the handwriting. But when the handwriting is well formed, the teacher can then select passages without any particular attention to the writing. He can then concentrate the attention on the—

1. Difficulties of orthography or derivation; or upon the
2. Difficulties of style; or upon the
3. Difficulties of grammar

In such cases the lesson will be something more than a mere aid to spelling; it will become an instrument of culture, by elevating the style or the thoughts, or by enriching the expressive vocabulary of the pupils.

### Dictation.

**I. Its Function.**—This is one of the methods of teaching spelling and composition. It teaches spelling indirectly and composition directly. The chief aim of a dictation lesson should be to *prevent*, not to *correct* mistakes. For this reason it is necessary that it should usually be preceded by some kind of preparation, so that its real office becomes a *testing* rather than a *teaching* one.

### II. Subject Matter.

1. **Suitability.** The subject matter must be suitable to the capacities of the children. The thoughts and language should be within the grasp of their comprehension, and the limit should be kept within a little explanation from the teacher.
2. **Preparation.** It must be prepared in most cases. For young pupils to write unseens is to learn to write mistakes. Unseens are tests only, and our difficult system of spelling makes preparation absolutely essential.
3. **Quantity.** Long pieces may be a test of physical endurance, or of juvenile hard-headedness; but they can scarcely claim to be safe tests either of knowledge or intelligence, for the strain is too great for some pupils. It is not the *quantity dictated*, but the *amount corrected* which has the educational value. The amount will grow with the growing power of retaining phrases in the mind.
4. **Teacher.** The teacher must dictate the words once only. The disciplinary effect of this is great. He should previously read the passage through in a clear, deliberate voice, especially if the piece is a test. But he must never forget that distinct speech is no substitute for preparation.

**III. Correction.**—The methods of correction will generally depend upon the quantity and quality of the staff. There are four principal methods in use.

1. **Individual Correction by the Teacher.**—This is the best method, but certain objections are alleged against it.

(a) It is too expensive in time to be done *in* school hours.

(b) It is unjust to expect a teacher to do it *out* of school hours as a rule. Such methods of correction should be the exception and not the rule.

**2. Monitorial Correction.**—In some schools monitors or curators are selected to examine the work. It is an office of trust and responsibility, and so becomes an aid to diligence and progress. But this, like all other methods, is open to *objections*.

(a) It is unfair to the monitors. It is a wearying task; and unless special arrangements are made for the adequate instruction of the monitors, they lose their own lessons.

(b) If the monitors are paid this objection disappears, but even then there is a very poor return for so much fagging work.

(c) It involves implicit trust in the monitors. The monitor, remembering his tender years, may prove unreliable from some cause or other.

(d) The monitor, from fatigue, or indifference, or a weak sense of duty, may correct carelessly.

(e) Monitorial correction may breed ill-feeling in the class.

**3. Inter-Correction.**—This is a rather risky method. The children change slates or books, and correct each other's work. They are thus revising the lesson and correcting at the same time. The method is open to *serious objections*.

(a) It tends to collusion between scholars to mark work dishonestly.

(b) It gives opportunities for the display of petty spite, malice, revenge, etc., in the incorrect marking of exercises.

(c) It leads to disputes, bad feeling, and disorder. Children are prepared to dispute the marking of a fellow-pupil.

**4. Self-Correction.**—This method allows the class to correct their own work at the dictation of the teacher. It is the same process of correction as 3, with the exception that each pupil marks his own books. Its *objections* are:—

(a) It places too great a strain upon the moral strength of some of the pupils. There are more moral weaklings than either physical or mental ones, and it is unwise and unjust to set many a moral task beyond their moral strength.

(b) The primary object of correction is usually defeated—the *throwing up boldly* of all errors. There is too much self-tenderness with this method. Errors are either passed over, or else marked so faintly or so minutely as almost to escape attention.

**IV. The Moral Side of Correction.**—All correction should be done with the greatest care, and in a reasonable period of time. Books should rarely be kept more than a day or two. **The careless correction of errors produces a whole crop of evils**, some of the chief of which are as follows:—

1. A habit of **carelessness** is bred in the pupils. They become untidy in their methods, their lessons, and sometimes in their habits generally.

2. **Decay** is engendered. The pupil is induced to cheat, because there is less probability of detection.

3. It would cause **laziness** and probably **indifference**, for where a lack of care, and by inference a lack of interest are shown by the teacher, the infection will soon spread to the scholars and develop into laziness.

4. It **increases the difficulties of school work**. The pupil will cease to respect the teacher, and so discipline and teaching will become harder. This may lead to **increased severity** or **increased carelessness** on the part of the teacher.

5. The **tone** of the school will **deteriorate**. A careless teacher puts himself on an inclined plane, and the rate of his descent increases. In-

difference, untidiness, laziness, cheating, untruthfulness, loss of respect, all may arise from the careless correction of work.

6. It is unjust to the pupils. Each error is like a signpost guiding the direction of the teaching, for errors indicate the individual wants of the pupils. If these errors are carelessly treated, the child is deprived of that attention and training which it has a right to expect, and which it is just as rightly expected the teacher will give him.
7. It is wasteful, for much time, interest, power, and zeal are lost.

### NOTES ON A DICTATION LESSON.

(Class— Standard III. Time—30 minutes.)

#### I. Class Arrangement.

1. Arrange the class as widely apart as the desk space will allow.
2. See that the ink wells have been properly filled.
3. Have the dictation books and pens given out.

This is best done by placing the required number at the end of each row, and by having them passed upon the sign or command of the teacher.

*Dictation books* should be used—not pieces of paper. The book then becomes a *register of progress both in handwriting and spelling*. When filled, these books should be preserved by the teacher, for they allow him to collect and classify all the commonest spelling errors of the class, and so to arrange his future lessons to meet these recurring errors. He should not burden his lessons with words of rare occurrence.

#### II. Class Preparation.

1. The piece may have been previously prepared either—

- (a) In the Reading Lesson.
- (b) In the Transcription Lesson.
- (c) In a Spelling Lesson.
- (d) In Special Class Work.
- (e) In Composition Exercises.
- (f) In Home Work.

2. If not, write the following words on the B.B., and have them learnt :—

*Curfew, Tolls, Knell, Lowing, Lea, Ploughman, Weary, Glimmering, Landscape, Drowsy, etc.*

Have them spelt *simultaneously* and then *individually*.

3. Or have the piece previously written upon the B.B., underline the most difficult words, and turn the B.B. to the class so that the words may be learned. This is a good method, as the teacher cannot successfully anticipate the difficulties of every boy, whilst this method allows each boy to run through and select his own difficulties.

**III. Dictation.**—Read the passage through slowly and distinctly *once*; then dictate in phrases, samples of which are marked below :—

The curfew tolls | the knell of parting day ; |  
 The lowing herd | winds slowly | o'er the lea ; |  
 The ploughman homeward plods | his weary way, |  
 And leaves the world | to darkness and to me. |

#### IV. Correction.

1. Change books; vary the method, sometimes with the boy in front, sometimes with the one behind; to the right to the left; the end boy on the right hand of each row to pass his book to the left-hand boy of his row, and then return to his place. Then pass the rest of the books one place to the right.

2. (a) Spell the passage through distinctly, and have each misspelt word *marked through* in each book. The total number of errors should be put at the end of the exercise. If the word is underlined it allows more chance of alteration and consequent dispute. Marking through prevents this.
- (b) Or let them correct from their reading books, if the piece be taken from a reading book. In this case the right number of books should have been previously placed at the end of each row, and when the books have been exchanged, upon the sign of the teacher the books should be passed and the page announced.
- (c) Or it can be corrected by having the piece previously written on the B.B. Everything is then ready (see No. 3 under Class Preparation).
3. Books to be changed back to their owners.
4. Now write the most difficult words on the B.B. Methods (b) and (c) avoid this waste of time.
5. Have the errors carefully written under the exercise, learned, and repeated to the teacher, who is moving quietly about the class hearing mistakes spelt, inspecting books, and marking the exercises. If the class is very large, one or two of the best pupils might be called upon to assist.

**V. Conclusion.**—The dictation books and reading books (if used) to be passed to the ends of the desks; the pens also should be passed unless required for the next lesson.

#### EXAMINATION QUESTIONS.

- 1.—Name eight words in the spelling of which young children often make mistakes, and explain by what sort of exercises such mistakes may be corrected or avoided.
- 2.—Take the following words, and give a list of others which might be grouped with them for a spelling lesson: *rough, should, which, many, taught*.
- 3.—What preparatory observations as to difficulties of spelling should be made before proceeding to write from dictation the following passage?—  
 "The watery dykes display luxuriant verdure; bulrushes and water-flags have attained their freshness; willows are rich with foliage in sylvan nooks; agreeably hidden in a leafy arbour you may catch glimpses of the retiring denizens of the more secluded labyrinths of the forests".
- 4.—Distinguish the uses of dictation and transcription lessons for children lately transferred from an infant school.
- 5.—Show that some words would present special difficulties of spelling in the following passage, dictated to children who had not passed the Second Standard:—  
 "The tiger's tongue is so rough, that if it were to lick your hand it would cause blood to flow; its colour is a light tawny brown, with beautiful black stripes; its feet are cushioned, and it has whiskers to help it feel its way".
- 6.—Before giving out a passage for dictation, what preparation is needed to prevent possible misspellings?
- 7.—Describe the various methods used to teach spelling in your school. Did you rely chiefly on the eye or on the ear in teaching spelling?
- 8.—Give some (not more than six) of the commonest misspellings of children in the First Standard, and account for each natural confusion in spelling. How did you correct written exercises in spelling?
- 9.—How have you been accustomed to give a dictation lesson? How was the exercise corrected? What expedients were adopted to prevent copying?
- 10.—How would you conduct a dictation lesson to the Third Standard? How should the mistakes be corrected?
- 11.—Mention any twelve words, the spelling of which presents special difficulty to young learners; and say by what sort of exercises you can best help such learners to spell them correctly.
- 12.—What points would you chiefly keep in view in giving a dictation lesson?
- 13.—Name some of the commonest faults of young assistants in teaching spelling. How much of a spelling exercise should be oral, and how much should be written?

## CHAPTER XI.

## WRITING.

WRITING is important and valuable both for its practical worth and its aid to training. It is a recognised and essential means of communication in private life. It bridges distance, and brings the absent within the range of conversation. Its business importance is too obvious to need comment. Professionally it may generally be taken to indicate the character of the school and its work. It appeals easily and readily to the parents as an index of the progress of their children; a just pride is bred, which reacts favourably on the school reputation, and consequently upon its attendance. Nor is its literary value less. Before the invention of printing all books were written, and they still have to be written, although they are given to the world in a printed form. But the literature of a country is dependent upon writing for its existence and growth. Shorthand is a form of writing with a new set of symbols. Nevertheless, it is writing, and a very important development of it too. Its importance is recognised by the Code and our schools in a practical way; and for journalism, office work, and secretarial duties, it is now almost absolutely essential.

Nor are the training advantages of writing to be overlooked. Without being what is understood as an intellectual subject, it nevertheless affords some training, both mental and moral. The careful and successful writer is taught to *observe* form and proportion closely, to note those small details which give quality and style to the writing. The *memory* is exercised in the earlier stages in remembering the items observed, although little memory training can be claimed for what is almost purely an *imitative* exercise. There is more training for the *attention* if the lessons are properly supervised and carried on, whilst the *judgment* is cultivated by the study of spacing, slopes, and proportion. The *artistic* value of writing must also be recognised, for it is a



correlative to drawing, and it develops the sense of beauty and proportion.

Writing is not without its moral advantages. It induces habits of neatness, care, and accuracy, which help to leaven the whole character.

**Position for Writing.**—As writing is a mechanical acquirement very largely, it is essential that the physical side of the subject should receive proper attention, so that no habits injurious to health may be formed. This will include the consideration of such things as the position of the body, the place of the slate or paper, light, the position of the ink, and the holding of the pen.

1. **Body.**—The body must be kept in an easy position, upright, and not leaning against the edge of the desk, but nearly as possible parallel with it. There should be no leaning either one way or the other, otherwise the weight of the body will not be evenly distributed on the seat. The pupil should not be allowed to bend over the work, nor to rest the head upon the left hand. (See notes on "Desks".)

2. **Slates, etc.**—The slate, copy-book, or paper should be parallel with the desk, but placed slightly to the right, so that the handle of the pen should point over the right shoulder.

3. **Light.**—If possible, this should fall from the left. (See notes on "Light".)

4. **Ink.**—This should be placed slightly to the right, so as not to necessitate a change of position.

5. **Holding the Pen.**

(a) The pen will be held between the first two fingers on the one side, and the thumb on the other.

(b) The two fingers and the thumb should all be bent—the thumb most so.

(c) The forefinger should rest upon the top of the pen.

(d) The hand should rest upon the last two fingers.

(e) The pen should be held lightly, and should point towards the shoulder. Both sides should be equally pressed, but not clutched.

(f) The pen should not be held too near the nib. If too near, the action is cramped, the writing often stiff, and the work more often dirty.

(g) The arm should rest on the desk a little below the elbow.

(h) The hand should not be supported by the wrist, or rapidity and quality will suffer.

### MULHAUSER'S METHOD.


Mulhauser belonged to Geneva, and he prepared his system of writing at the request of the French Government. It was introduced into this country in 1840 by the Committee of Council on Education. He lays down certain *essentials* for good writing, which refer to the seat, the body, and the pen. The child was to be well seated, with its body in a healthy position, and the pen was to be properly held. His *theory* was that writing was to be as instructive as well as an imitative art. Experience has shown that the method, despite its complexity, is a good one.


### Principles of Construction.


1. The elements and the letters themselves were to be taught in the order of their simplicity.
2. The pupil was to be furnished with a standard by which he could determine for himself the height, the breadth, the inclination, and the points of combination of the letters. This was to be done by his celebrated system of rhomboids.
3. Such instruction was to be given in the course of the lesson as would make the exercise an intelligent and interesting one.

**Analysis of Movements.**—Analysis is the teacher's work, synthesis the child's. Writing is effected by movements of the hand and arm. Analysing these movements, he found there were four of the hand—up, down, right, and left; and that the movement of the arm was lateral to the right, and that by it the symmetry, uniformity, and parallelism of the writing was to be maintained.

**Analysis of Letters.**—These are resolved into elements. Some say that there are but four; *e.g.* :—

(a) The **right line** down and up, as ;

(b) The **curve** down and up, as ;

(c) The **loop** down and up, as ;

(d) The **crotchet**, as in the .

But perhaps it will be better to divide them into eight elements.

(a) **Right Line.** This has four different heights, and it is the first principal element.

- (1) One height as in *i*.
- (2) One and a half heights, as in *t*.
- (3) Two heights, as in *h*.
- (4) Two and a half heights, as in *p*.

(b) **Link.** This is the first connective element. It forms the latter part of the letters *i*, *e*, *t*, *m*, *n*, etc.

(c) **Hook.** This is the second connective element. It forms the first part of the letters *n*, *m*, *v*, *y*, etc.

(d) **Curve.** This is the second principal element. It is found in the letters *o*, *c*, and *e*.

(e) **Loop.** This is the third principal element; found in *e*, *y*, *g*.

(f) **Crotchet.** This is the fourth principal element, as in the latter parts of *r*, *v*, *b*, *w*.

(g) **Bar.** As in the *f*.

(h) **Dot.** As in the *i* and the *j*.

**Method of Teaching.**

1. **Mechanical Aids.**—As one aim of the system is to enable the pupil to determine the proportion, inclination, and joinings of the elements and letters by a definite standard, he is furnished with books ruled into spaces the width and half the height of the letter *O*.

(a) **Terms.**

$\frac{1}{2}$  height = the vertical distance between two lines.

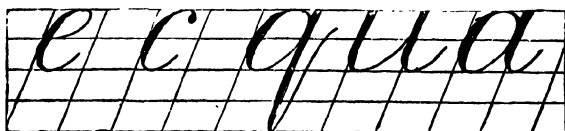
One space = the lateral " " "

One height = the vertical " " three lines.

(b) **Letter Spacing.**

1 space = the width of *e*, *c*, *q*, etc.

2 spaces = " " *u*, *a*, *h*, *p*.

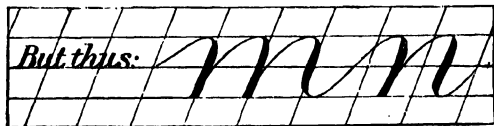
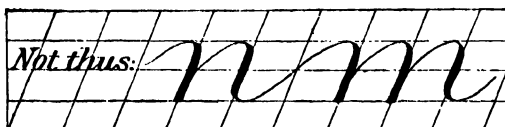
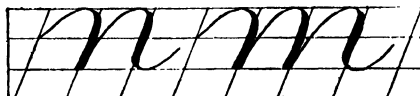


3 spaces = the width of *n*.

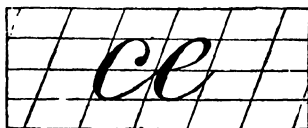
4 spaces = " " " *m*.

4 lines =  $1\frac{1}{2}$  heights.

5 lines = 2 " "



But when *n* and *m* come together, they will be found to occupy not 7 but 6 spaces. That is, there is a difficulty *when a hook follows a link*. The two occupy a space and a half—not two spaces, as might be



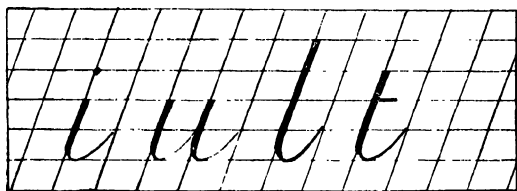
supposed. Similarly, a half space is lost when *c* or *e* is followed by a hook.

**2. Instruction and Practice.**

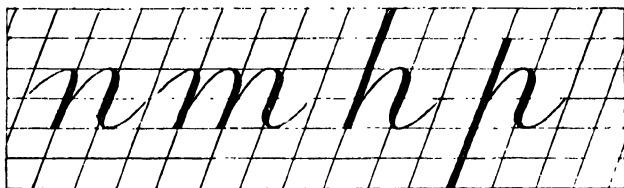
- (a) The teacher writes on the B.B. and names each element.
- (b) The teacher then writes letters and words on the B.B., the elements of which are dictated by the children.
- (c) Then the children write elements and letters from the teacher's dictation.

**3. Classification.**—Thoroughness was insisted on. No child was allowed to leave anything until it had mastered it. The course consisted in giving elements, then letters, then words.

- (a) **Right Line Link Class.**—The first lessons should be confined to this class, which includes the elements of the letters *i, u, l, t*.



- (b) **Hook Class.**—The elements involved now are right line + link + hook. This will embrace the letters *n, m, h, p*.

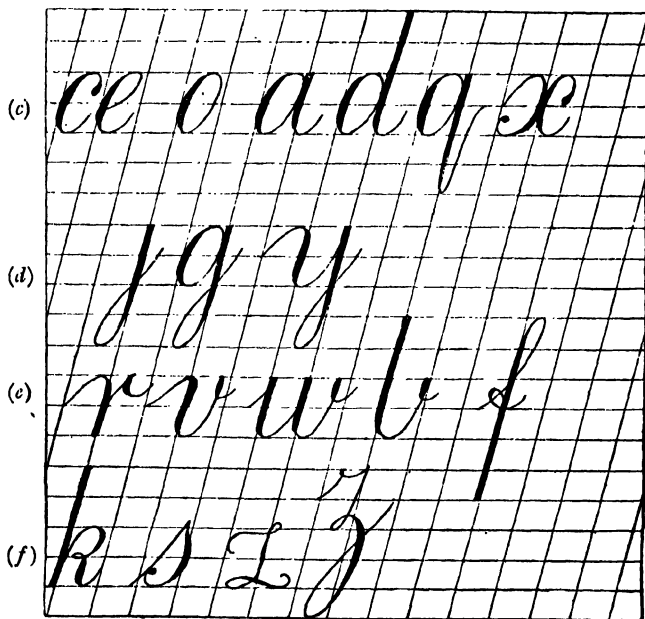


- (c) **The Curve Class.**\*—The *curve* is next introduced, and the elements involved are right line + link + hook + curve. Any letters containing these elements only can now be introduced.
- (d) **The Loop Class.**—The *loop* is the next element. The elements now involved are the right line + link + hook + curve + loop. This admits the letters *j, g, and y*. In each case the heights and spacings of the letters should be noticed.
- (e) **The Crotchet Class.**—The *crotchet* is next introduced. The elements now are right line + link + hook + curve + loop + crotchet. The letters *b, f, r, v, w* can now be introduced.
- (f) **The Complex Class.**—The letters of this class do not fall readily into any of the preceding classes, and they have little in common. Each should be practised until its shape is quite familiar. This class includes the letters *k, s, and z*.

**4. Criticism.**—The method is well graded, commencing with the simplest elements and progressing to the most difficult letters. The rhomboids are a great aid for parallelism of slope, and they offer some assistance in spacing, as well as securing uniformity and proportion. But if a too free use of the rhomboids be made they become a hindrance. They are always more or less confusing, and often discouraging. The method is uninteresting in its earlier

\* The following classes are illustrated on the next page.

stages, just when interest requires to be strong. The child is kept making strokes and pot hooks till it wearies of the whole thing. The variation of rules for the spacing of different combinations of letters is very perplexing to young pupils, and the whole method generally is too technical for speedy progress. Nevertheless, the system has stood the test of experience, and proved itself a good one, and up to the present no better system, on the whole, has yet arisen to take its place. The Education Department show their appreciation of it by frequently setting questions upon it in their examinations, and the young student is advised to study it thoroughly from some such book as Cowham's *Mulhauser's Manual of Writing*.



#### Questions on Mulhauser's System.

1. Arrange the following words in order according to the difficulty of writing they present to beginners, and give your reasons: *man, mat, mamma, mask, mast, men, meat, mend, mane, most, mind* (1877).

Now, to answer a question like this turn to Mulhauser's classes. Analyse the words here given into their elements, noting which class they fall into. Arrange them in their classes on this basis, and that will be the arrangement required. Your reasons will be the reasons for Mulhauser's classes; e.g. :—

<b>man</b> ;	elements involved are	right line, link, hook, double curve.	Classes 1, 2, and 3.
<b>mat</b> ;	„ „	right line, link, bar, double curve.	Classes 1 and 3.
<b>mamma</b> ;	„ „	right line, link, hook, double curve.	Classes 1, 2, and 3.
<b>mask</b> ;	„ „	right line, link, and two complex letters.	Classes 1, 3, and 6.
<b>men</b> ;	„ „	loop, curve, link, hook, right line.	Classes 1, 2, 3, and 4.
<b>meat</b> ;	„ „	loop, curve, link, double curve, right line, bar.	Classes 1, 2, 3, and 4.
<b>mend</b> ;	„ „	loop, curve, link, hook, right line, double curve.	Classes 1, 2, 3, and 4.
<b>mane</b> ;	„ „	double curve, right line, link, hook, loop, curve.	Classes 1, 2, 3, and 4.
<b>most</b> ;	„ „	double curve, $\frac{1}{2}$ crotchet, complex, right line, link, bar.	Classes 1, 3, 5, and 6.
<b>mind</b> ;	„ „	right line, link, hook, double curve.	Classes 1, 2, and 3.

The letter *m*, *i.e.*, the initial *m*, has not been considered in these analyses, as it figures in every word, and therefore cannot influence the difficulty of one against the other. Where the elements are the same the length of the word becomes a factor, and the combinations ; *e.g.*, the elements of *mind* and *mamma* are the same, but *mind* is considered easier than *mamma* because it is shorter. Tested in this way, the words present themselves in the following order of difficulty : **mat, man, mind, mamma, men, meat, mend, mane, most, mask.**

2. Show clearly the elementary component parts of the written letters, *a, h, g, m, d* (1876).

Turn to Mulhauser's classes, and analyse the letters into their elements, thus :—

**a** = double curve, right line, link (*O I U*).

**h** = right line, two heights (*I*), hook (*η*), right line (*I*), link (*L*).

**g** = double curve (*O*), right line, two heights down (*I*), loop (*J*),  $\frac{1}{2}$  link (*I*).

**m** =  $\begin{cases} \text{hook } (\eta), \text{ right line } (I). \\ \text{do., do.} \end{cases}$

$\begin{cases} \text{do., do., link } (U). \end{cases}$

**d** = double curve (*O*), right line, two heights (*I*), link (*U*)

**Heights of Letters.**—The heights of the letters should be committed to memory. The pupil should also practise himself in spacing the letters in different combinations, *e.g.*, *cru, mn*.

**One height** = *a, c, e, l, m, n, o, r, s, u, v, w, x.*

**One height and a half** = *t.*

**Two heights** = *b, d, h, k, l, q.*

**Two heights and a half** = *g, j, p, y, z.* (Two heights are now more general.)

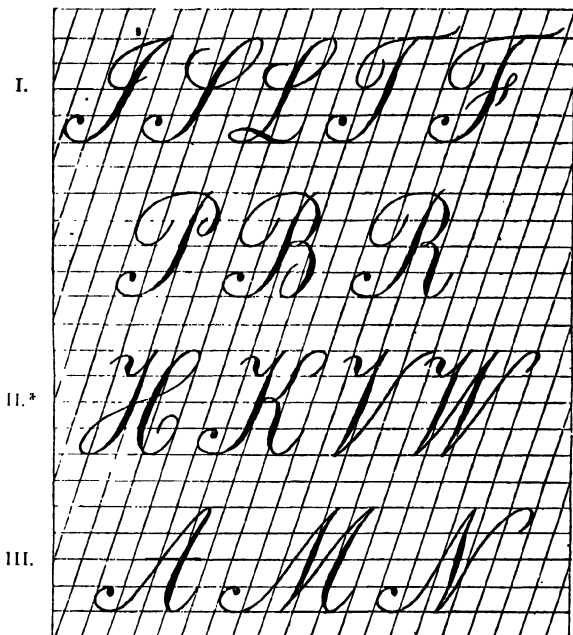
**Three heights** = *f.*

## CLASSIFICATION OF CAPITAL LETTERS.

Capital letters should be classified according to their similarity of form, and should be taught for writing in the groups thus formed. Any system of ruling by which the forms and proportions of letters are duly shown, and which produces a bold and legible

style, may be accounted a good one. But whatever system of ruling is adopted, generally speaking, each capital letter should be twice the height of a small letter, and this is true of all letters except J, Y, G and Z; these are  $\frac{1}{2}$  higher. Mulhauser's system does not deal with capitals.

**Group I.** *The common element is the down stroke of the I.* The base of the letters should not be made too small, as they then look top heavy and inartistic. A common fault is to make the left-hand portions of the P, B, and R too small.



The right-hand loop of the P is often too large, whilst the up curve of the I is often written as a down curve. The T is the easiest letter, and should be taught first. The others should follow in this order: F, I, S, L, P, B, R.

**Group II.** The common element is *the down stroke with the hook head*. These letters are difficult, and require plenty of practice.

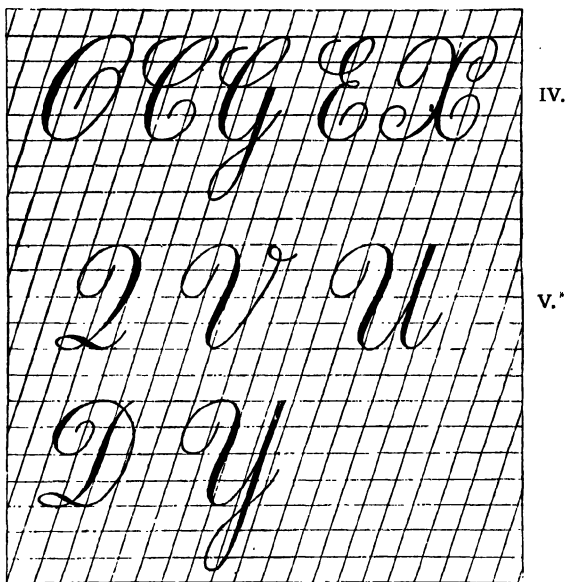
**Group III.** The common element here is *the upward curve*, which forms the first part of each letter. In the M and the N the teacher must see that the *up curves are parallel*. The neglect of this rule causes the production of some very distorted looking letters.

**Group IV.** The *curve* is the common element of this class. The letters will require plenty of practice to give that free sweep of the pen which is so requisite for the proper production of letters containing curves such as these.

\* The Z should be in this group.

**Group V.** The curve again is the common element, but it is the *reverse curve*. In this group the curve falls to the right; in Group IV. it goes to the left. It is a down curve in each letter except *D*, where it is an up curve. *D* is a difficult letter, and will require plenty of practice.

If the capitals are to be practised with rhomboids then copy books suitably ruled (B.B. also) must be supplied.



### A SCHEME OF WRITING FOR INFANT SCHOOLS.

Writing can commence in the earliest classes of an infant school, for it makes little or no demand on the brain. It is an art which recognises the child's love of activity by encouraging its imitative faculty. Locke, in his system of writing, recommends that writing should begin when the child can read; but there is no necessity to wait so long. Instruction in the two subjects may go on together; and if any preference in time is to be given to either, then it must be to writing, as being the easier and more pleasing exercise.

**I. Preparation.**—There are certain preliminaries requiring the teacher's attention for the successful working of any scheme. With young children like these, the holding of the pencil, the

\* V is given twice. Its position depends upon its method of formation.



position of the body, the length and pointing of the pencil, the slates, and B.B. will all need attention. The *pencils* should be pointed, and of reasonable length. Short pencils should be forbidden, as they lead to a cramped style. The *slates* should be ruled on one side in rhomboids, and the *B.B.* should be ruled to match the slates.

With young children like these, the formation of *good habits* is equally important with the formation of a good style of writing. For this reason there should be some *preliminary drill* leading up to the writing lesson. The slates and pencils should be orderly passed, the holding of the pencil should be shown and imitated, and the healthy position of the children should be insisted on.

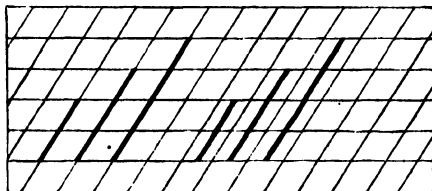
## II. Plan of a Lesson.

1. **Copy setting.** The teacher writes on the B.B. the element or letter which the children have to imitate, the children watching carefully.
2. **Imitation.** The children then imitate on their slates
3. **Position.** Meantime the teacher is noting the position of each child, and the way it is holding its pencil.
4. **Examination.** Every step must be seen by the teacher. The individual efforts of the children invariably call for fresh explanation and further demonstration on the B.B.
5. **Repetition.** The teacher goes through the same process with the next portion of the lesson, and so on until the lesson is complete.
6. **Revision** The whole lesson should be revised.

## III. Order of Lessons.

1. **Early Lessons.**—These should be confined—

(a) To the simplest elements of the letters. The first lessons should be devoted to the **right line**, and this should be practised at various heights.



The B.B. and one side of the slates should be ruled with rhomboids, and the earliest efforts should be limited to 1 height. Then  $1\frac{1}{2}$  heights, and finally 2 heights. A right line of 2 heights requires more muscular control than at 1 height, hence a beginning should be made with 1 height. These lessons will simply form another example of their earliest drawing efforts, which will be limited to straight lines drawn with similar aids. When a fair degree of proficiency is attained on the lines, the class should receive lessons and practice in writing the same element *between* the lines.

- (b) **The Link** should be taken next, as it is the simplest extension of the right line for the purposes of writing. Here, again, the same order should be pursued, both as to heights and lines and spaces. The teacher might then combine these elements into a word—*til*—thus giving the first lesson in **joins**, and bringing more interest to bear on the work. The addition of the **bar** in the letter *t* will present no difficulty.
- (c) **The Hook**.—This is another simple combination with the right line. The same steps should be followed as in the previous cases. The element



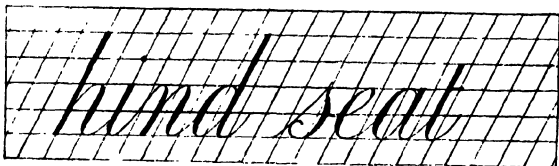
should be practised separately, first on *lines*, then in *spaces*, and then with the *joins*. The letters *u*, *n*, and *m* could then be introduced, and combinations made of these three elements into words such as *in*, *tin*, *nit*, *til*, *mil*, etc. The letters *p* and *h* can now be introduced, the number of words thus being again increased. These lessons ought to be sufficient for the baby room and for the class above, but the division of a scheme must of necessity depend upon the number of classes in the

school. But if the school be small or the staff weak, too little should be attempted at the bottom, rather than too much at the top. Assuming there are six classes in the school, and a baby room, the next lesson should commence with Class V.

2. **Class V.**—The remaining elements should now be introduced, *viz.*, the **curve**, single (i) and double (O), the **loop**, both up and down (l j) and the **crotchet** (Λ). They should be introduced in the order named, and each element should pass through the same stages of treatment as in the previous cases. Combinations should be introduced as each element is mastered, so that interest may not flag. Later on the **complex** letters **s, x, z, k** should be given one at the time, and finally the class should be writing small words. The writing should be  $\frac{3}{8}$  of an inch.



3. **Class IV.**—The work of this class should be a simple expansion of the work in Class V. Longer words should be introduced, and more difficult combinations. The writing should still be  $\frac{3}{8}$  of an inch in height. If the rhomboids are retained, the height of the rhomboids must determine the size of the writing but, if possible, the rhomboids should be ruled  $\frac{3}{8}$  of an inch in height.



4. **Class III.** The capital letters should now be introduced in the order previously laid down for their classification. Their height should be  $\frac{5}{8}$  of an inch, or twice the size of the other letters. For capitals the rhomboids are perplexing at first, but patience will overcome this difficulty. Slates should still be used, but if paper is adopted then the children should have the assistance of **tracing**, which could be done by the teacher with black lead, and should be apportioned to the individual wants of each child. Copies should be set on the B, B, and the construction, height, and proportion of each letter, as well as the joins, should be repeatedly demonstrated. The formation of a good style at this plastic age is very important. Heights should not yet be looped.

5. **Class II.**—The work should now be on paper, although there is a divisor of opinion on the subject. The work will consist of a recapitulation of the steps already taken on slates. The climax will be to produce the same degree of work and excellence on paper that is produced in Class III. on slates. *Tracing* will still be used with the same restrictions as in the previous Standard, and the teacher is recommended to *pattern-write*, whenever opportunity presents itself in the books or on the paper of each child. Nothing stimulates effort and tends to produce a good style and a uniform "hand" like this. If the work is still confined to slates, a greater degree of excellence should be expected, and double heights (except *d*, of course) should be looped.

6. **Class I.**—The same standard of writing should be reached here as is expected in Standard I.

**THE SIZE OF WRITING.**

**I. Small Hand.**—The introduction of small hand should not be deferred too long. Writing, in school life, obtains much of its value as an aid to other departments of instruction, and it is not well to let such a force lie idle longer than necessary, despite its difficulties.

**1. Difficulties.**—The chief difficulties are mechanical. A finer command of the *muscles* of the hand and arm is required; the *judgment* requires more development, for neither proportions nor space are so obvious as in large or text hand. As a result it makes more demand on the *eye*, hence more cultivation is needed for the proper appreciation of the forms and proportions of the letters, and greater care and exactness are required for regularity and uniformity.

**2. How learned.** Small hand may be learned best by a careful gradation of the size of the writing. When children leave an infant school their writing is generally large or half text. In the upper departments a First Standard should write half text, *i.e.*, the writing should be about  $\frac{3}{4}$  of an inch in size. A large small hand might be adopted for Standard II., and a legitimate small hand might reasonably be expected in Standard III.

The copy books and exercise books should be double ruled up to the Third Standard. This mechanical aid, supplemented by ordinary care and teaching, with *pattern-writing* now and then in the books of the pupils, and with demonstrations of the most apparent errors on the B.B., ought to secure good small hand.

**II. Large Hand.**—There is a good deal of vagueness as to what is meant by large hand. It is synonymous with text and half text, and practically means that the small letters are to be  $\frac{3}{4}$  of an inch in height. The object to be kept in view is command of the pen and freedom of hand. It increases and develops the power gained over the hand, and should therefore be practised sometimes in the higher classes. Apart from this it has a good business value, and therefore should be maintained. Its advantages are the antithesis of the difficulties of small hand. It also provides a desirable change from the small hand, appeals more to the artistic sense, and helps to maintain a good style.

**Copies.**—There are three methods in use.

**I. Set Copies.**—Blank books are used by many teachers who set their own copies; and where this system is possible, it is considered by many to be the best, for the following reasons:—

1. The pupil is encouraged to do what he knows his teacher *has* done. The value of the copy is increased if the child can *see* the teacher set the copy under similar conditions to those under which he has to write it afterwards.
2. Writing is an *imitative* process, and the imitative faculty is more encouraged than by any other process.
3. Set copies are an *aid to discipline*. Children appreciate good writing more rapidly than excellence in any other subject. The teacher who writes fine copy-heads wins the admiration of the class.
4. They can be *readily varied* to suit the varying progress of the different scholars.

**Objections.**—There are certain objections urged against this system by the advocates of the next, whether the copy-heads are written in the books or the copy is set from the B.B. In most schools with their large classes the B.B. copies must of necessity be the form the set copies take, as there would not be time for individual copy setting. As a matter of fact, the objections are practically levelled against the B.B. copies, because few teachers have the time to practise the other method. Mr. Jackson makes the following objections :—

1. *B.B. copies are inferior and defective*, and inferior copies produce defective writing. The teacher requires to write a good hand to teach properly from B.B. copies ; but many teachers cannot write well, and therefore for many teachers the system is not an efficient one.
2. *B.B. copies are irregular and varying*. Change of class or Standard, or change of teacher, will change not only the style of writing but the mode or method of instruction also.
3. *B.B. copies are often ungraded or badly graded*. This weakness is likely to be found in rural and very large schools. It is asserted that it is not possible to obtain properly graded copies from haphazard sentences extemporised for the occasion. The teacher's labours will thus be heavily handicapped and the progress proportionately retarded.
4. *B.B. copies are so transient*. Efficient correction is simply an impossibility, more particularly in large classes. After the writing lesson of the day, correction by comparison is out of the question.
5. *The promiscuous character of these copies* seriously militates against their adoption. The copies are neither consecutive, well arranged, nor educative very often.
6. *Individual grading is impossible with B.B. copies*, and this is one of the most serious flaws of the system ; 40 to 60 boys, however classified, must require distinct and separate treatment, and they cannot get it from B.B. copies.
7. *B.B. copies waste time*—the time the teacher takes in setting the copy, the time the quick, the gifted, and the facile lose in going the same pace as the slowest members of the class.
8. *B.B. copies are more difficult*. It is much easier to *fac-simile* the same size, than to *reduce* and *fac-simile*. It is easier to imitate a copy on paper than a copy on a B.B. often many feet distant from the paper.
9. *B.B. copies make no provision for short-sighted children*, and this may prove another serious objection.
10. *They make no provision for absentees*. This becomes a particular case of the sixth objection. If a child has been absent for some time, it has to do the same work as those whose instruction and practice have never stopped.
11. *Generally, the use of blank books is an attempt to elevate an art by the removal of its highest and most perfect models, and by the substitution of inferior standards*

**II. Engraved Headlines.**—This is the copy-book system, with its printed or engraved copies. It is the system generally in use, and the large classes of our town modern schools make it almost a necessity. It is an easy plan, and saves the teacher's time, but it is not considered a good plan by some until the child has mastered the ordinary difficulties of writing ; and an abuse of the system has been responsible for a good deal of bad writing. These headlines are one of the results of the pupil teacher system, and an able and conscientious pupil teacher could give good writing lessons with their aid.

The engraved headlines can be placed two or three on a page, and they are, as a rule, well graduated and often educative. Mechanical aids, where necessary, are given, and to the extent thought desirable. If each page contains several copies, there is some guarantee that the pupils will imitate their copies. But unless the books are inspected every two or three lines, or unless the teacher is passing continuously from boy to boy during the writing lesson, the copies will often be unnoticed by the pupils, and bad habits and bad writing are very often the result. A study of the objections to B.B. copies would suggest the advantages alleged by some teachers to be possessed by engraved headlines.

**III. Copy Slips.**—Undoubtedly this is the worst method, and fortunately it is rapidly disappearing. The following are the objections usually put forward against them :—

1. Pupils write first line from imitation, and then very often take no further notice of their copy slip. Close supervision is the only way to check this.
2. The copy slips soon become dirty and ragged, and their moral influence is then bad for the school.
3. However expeditiously they may be distributed, there must always be an unnecessary expenditure of time over the process. The little thought required to fix and select a properly graded copy may become a serious item in the total, especially if the class is a large one.
4. But used by a skilful and careful teacher, in conjunction with the B.B., they may be of some use. The system allows good gradation, and the copy slips may be moved down the book so as to have the copy always immediately above the pupil's writing.

## TRACING.

**I. Advantages.**—Tracing in writing is some aid to a beginner. The muscles are trained, the style of writing is more or less fixed, the proportions of letters are given, the spacing is regulated, the joins and uniformity of thickness are taught, the eye and the judgment are simultaneously cultivated with the muscles, and the class all acquire the same "hand".

**II. Teaching.**—The chief thing for the teacher to decide is how much tracing can be allowed with the greatest profit. Writing is an imitative art, and is commenced when the imitative faculty is strong in children, and the muscles are plastic. But it is doubtful whether it teaches much in the way of imitation. It is good hand training; it is not so certain that it is good eye training. The children often trace or mark over the letters mechanically, with little or no thought of form.

All new elements should be traced as they are introduced; and they should be introduced as laid down in the "System of Writing for Infant Schools". The amount of tracing requisite really depends upon the individual capacity of each child; but as the teacher will be compelled to adopt a series of copy books, as a rule, he should seek a series which grades the tracing best. Some such graduation as follows should be expected:—

1. The *element* is introduced, and there will be a *copy or two of tracing*.
2. Then follow copies in which the *tracing is intermitted with independent effort*, the intervals for the latter gradually becoming less.
3. Then will follow a copy or two of *independent effort*.
4. The *next element* should then be introduced, and the same order should be observed.
5. *Combination exercises* should then be given.
6. This order will be continued until a letter or letters can be made. The tracing should still be graded, but the *quantity* should be reduced.
7. Tracing will not be needed beyond the "letter" stage. When a pupil can make "letters" he should be thrown on his own resources, so far as tracing is concerned.

### III. Disadvantages.

1. Unless carefully watched and regulated, tracing may make the children dependent, careless, and lazy.
2. If the teacher uses blank books, or gives tracing assistance in any books, he must be a good writer, or the class will repeat his deficiencies.
3. The printed copies for tracing, with their copperplate perfection, often discourage the scholar, who thinks such excellence unattainable. Hence the teacher must often supply the trace in black lead.
4. It allows the pupils, unless closely watched, to begin their letters anywhere, and so to generate bad habits in writing.

### HOW TO TEST WRITING.

1. The down strokes of right lines must be of uniform thickness.
2. The strokes must not be rough.
3. The letters must be well proportioned.
4. The links and hooks must be neither too thick nor too fine.
5. The curves must be properly formed.
6. The letters must be properly joined.
7. The letters must preserve their parallelism.
8. The form of the letters must be accurate.
9. The letters must be carefully spaced.
10. The composition, transcription, and dictation exercise should bear out the style and character of the copy setting.

### GOOD WRITING.

**I Its Characteristics.**—These are legibility, grace or symmetry, ease and rapidity.

### II How Secured.

1. **Legibility.**—Legibility in writing ought to be as important as distinctness in articulation. This is the first and most essential attribute of writing, and if

necessary everything else should give way to it. If the writing is to be legible the letters must be simple, for flourishes spoil legibility. The letters should be round or oval, according to the style used, but never pointed, as in the angular Italian "ladies'" hand. Good writing is always legible, and the upright hand is probably more legible than the sloping. The heights and thickness of the letters must be attended to, for uniformity aids legibility. The letters and words should also be correctly spaced, and the joins carefully made.

**2. Grace.**—By grace or symmetry of style we mean that the forms of the letters should be pleasing to the eye. Many of the elements of legibility are also elements of beauty especially parallelism, finish, and uniformity.

**3. Ease and Rapidity.**—These are the result mainly of a good style and plenty of practice. The position of the body, the manner of holding the pen, the style of writing adopted, the kind of training the pupil has received in this subject, the absence of flourishes, and personal endowment are all factors requiring attention. The pupil should not be allowed to take the pen off the paper, as a rule, whilst writing a word, or the writing may be neither free nor flowing. Under no circumstances must legibility be sacrificed to pace.

### Points to be Noticed in Writing Lessons. (Pearson.)

1. The difference between examination and teaching. Is every child taught to write, or is the teacher merely satisfied with examining *how* he writes?
2. Let the child begin to handle the pen as soon as possible; *i.e.*, as soon as he has progressed far enough in the use of the pencil.
3. Is the work of the classes *systematically* corrected, so as to regulate pace as well as to test the results?
4. Can the teacher write well on the B.B.?
5. Can he give collective instruction in writing?

With respect to number 4 the Department has expressed an opinion on this subject. It says: "The capacity to teach handwriting is an essential qualification of any teacher; but a teacher who is himself a bad writer can never, by the most skilful teaching, entirely destroy the bad effect of his own example".

**CHIEF ERRORS IN WRITING.**—The Education Department itself has laid down the most noticeable errors in writing. According to its own memorandum issued on the subject, these are:—

1. "Want of uniformity in the thickness of the straight lines.
2. Roughness of stroke.
3. Letters too tall or too short.
4. Links and hooks too thick or too fine.
5. Curves wrongly formed.
6. Letters not properly formed;" and to these might be added:—
7. Unsuitable slope. It is sometimes too great, sometimes not parallel, sometimes too acute, sometimes too obtuse. From 90° to 60° is the best angle.
8. "Writing as taught in schools is apt to be too small and indistinct. Pupils should be taught to write a firm, round, legible hand."

### How to Deal with Them.

1. There should be demonstration on the B.B., and explanation of style, rules, etc., followed by pattern writing in the books of the chief offenders against uniformity of thickness.



2. Pattern writing is the best remedy for this.
3. The sizes of the letters should be given, and their relative sizes demonstrated on the B.B., which should be ruled to match the style of ruling on the slates. The errors should be placed side by side on the B.B. with the corrected copy.
4. These elements should be analysed on the B.B., and the correction should then proceed as in number 3. Analysis, comparison, and pattern writing should follow each other.
5. Correct the position of the body, and see that the pen is held properly. The curves are often badly made through physical faults. They are often wrongly formed through bad teaching, no teaching, bad supervision, and an abuse of rhomboids.
6. The same remarks are equally true here. Both faults have the same origin, and require the same treatment. The incorrect and the correct should be pointed out on the B.B. side by side; the letters should be analysed, and slowly formed in the presence of the class. Plenty of practice should then be given, supported by close supervision.
7. Use rhomboids, and give plenty of practice.
8. The remedy is obvious.

**Vertical Writing.**—The advocates of this system offer the following arguments in support of it:—

1. It is the most scientific, hygienic, consistent, and comprehensive. Three of these claims are debatable, but there is no doubt about the other. This system is undoubtedly more healthy than the sloping style. The body is straight and the shoulders are level. The two arms are placed equally, and the result is no twisting of the back, and no risk of curvature of the spine. Obliquity of vision is also guarded against, for the eyes are at equal distances from the writing. The writing, being upright, makes less strain on the eyes, for they are accustomed to the upright style in printing. It is also claimed for it that it prevents writers' cramp, and adapts itself equally to both hands.
2. It is the most simple and natural.
3. It is the easiest to teach, learn, and write.
4. It is the most rapid, legible, fluent, and elegant. It is undoubtedly the most rapid, for the strokes being shorter must take less time in making. Its approximation to printing, so far as direction is concerned, and its rounder base make it the most legible.
5. It is the most educative and the most carefully graded.
6. It is free from all empirical disfigurements, for it has simple capitals and short loops.
7. It secures the greatest freedom in junction.
8. It presents a minimum of shading in the down strokes.

### **Slates or Paper?**

Should young children begin to write on slates or on paper? There is some diversity of opinion, but there is not much diversity in practice on the subject. The following arguments are used:—

Slates.	Paper.
<p>1. Slates are more <b>economical</b>. It is almost too expensive to furnish every child continuously with paper in every school, and paper writing requires more teaching and more supervision.</p> <p>2. Slates are more conducive to <b>order</b> than paper, unless the school is remarkably well staffed. They are sooner given out, and more easily managed.</p> <p>3. <b>Progress</b> is more rapid with slates than with paper—at first; and, as writing helps spelling, composition, transcription, and dictation, there is better progress made in these subjects. Again, the pencil is easier to manipulate than the pen, and this brings slate writing under the general principle that difficulties should be approached one at a time.</p> <p>4. The <b>Code</b> begins with slates.</p> <p>5. Slates often involve the use of stumps of pencil, and they are therefore risky <b>training</b>.</p> <p>6. The ease with which errors can be corrected makes children <b>careless</b>.</p> <p>7. The <i>cleaning of slates</i> is generally filthy and dangerous.</p>	<p>1. Paper is more <b>instructive</b>. Experience shows that the ability to write well on slates does not necessarily mean ability to write well on paper; whereas, generally, the children who can write well on paper can write well on slates.</p> <p>2. Paper is best for <b>discipline</b>. Habits of care, accuracy, neatness, and beauty are more likely to be engendered by paper.</p> <p>3. Some, however, dispute this. They maintain that to begin on paper is <i>the quickest and most profitable way</i>, and that <i>slate writing is often a hindrance</i> to writing well on paper, from the formation of bad habits. Children can begin on paper with black lead pencils. This is a compromise between paper and slates; but with young children the breaking of the pencil points is a serious consideration.</p> <p><i>Judgment.</i> A weighing of this evidence shows that—  <i>Theoretically</i> it is best to begin on paper, for children gain greater ability, are better trained morally, and avoid hindrances.  <i>Practically.</i> Experience shows that it is best to begin on slates. It is more economical, more orderly, and more profitable for a time.</p>

### Manual Employments and Writing.

The connection between these two things is educationally very important; for as writing is essentially a matter for both hand and eye, and as the one great object of all manual employments is to train both hand and eye, the connection stands revealed at once. This truth is obvious from an examination of the qualities required for writing. The eye has to learn to distinguish the shades of outline, heights, and distances, which vary absolutely and relatively, and to appreciate the different grades of beauty in the various forms of curve employed. The child must learn to perceive a shape before he can imitate it. Then comes manual training. The discipline of the muscles, regulated by the judgment of the eye, and both demanding much practice, shows writing to be essentially a matter of hand and eye training.

Now, the problem is, which of the many exercises embraced under the terms Kindergarten or Manual Training give this required training in the sense demanded by writing, remembering that the problem applies to Infant School children?

The Kindergarten method of learning to write shows that

several "occupations" contribute to this training, for this method consists of four steps, each of which is a means for manual training.

1. **Clay Modelling.**—The hand is first trained upon moulding objects in clay.
2. **Paper Cutting.**—The cutting out of paper figures follows.
3. **Drawing.**—These exercises gradually lead up to elementary drawing.
4. **Writing.**—The children then commence writing lessons.

It will be noticed that *drawing* is the final step preparatory to writing itself; and if drawing be reckoned among such employments, it undoubtedly assists more than anything, for writing is but another form of drawing. This is obvious from a comparison of the elements involved.

	Writing.		Drawing.
/	The right line.		Perpendicular line.
l	The link.	—	Horizontal line.
hook	The hook.	\ /	Oblique lines.
crotch	The crotchet.		Various forms of the curve, including the $\bigcirc$ (circle).
curve	The curve.		Drawing is a combination of these.
bar	The bar.		
	Writing is a combination of these.		

### Ruling of Slates.

Slates may be ruled in several different ways, all of which have something to be said in their favour. One important method, the *rhomboidal*, has already been pointed out and illustrated, but other methods are now more frequently used. To say nothing of the trouble or expense of ruling, just where the rhomboids are most useful, there they are most confusing. Young children get muddled and discouraged with the many lines of this method and its many technicalities.

Generally, the style of ruling adopted will depend upon the class. The younger the class, up to a certain limit, the more help they want.

**For Infants.**—As a rule four lines are used in ruling the slates, but five are an improvement. When four only are used no line is given for joins, and children require as much help there as anywhere. The object is to avoid confusing the children whilst helping them, and this is easily done by a judicious mixture of faint and thick lines. A specimen of the proposed ruling follows. Between each complete set of lines as here shown a space of  $\frac{1}{8}$  of an inch should be left.

$\frac{3}{4}$  of an inch space.

$\frac{1}{8}$  " "

$\frac{1}{8}$  " "

$\frac{3}{8}$  " "

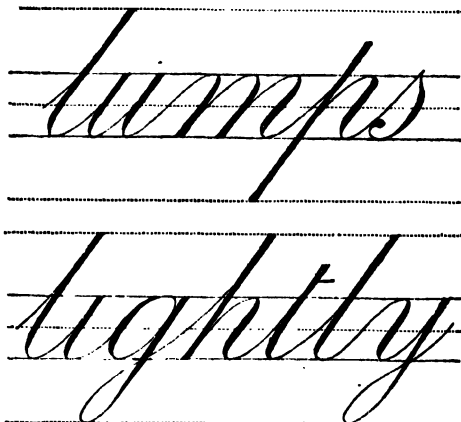
$\frac{3}{8}$  " "

$\frac{3}{8}$  " "

$\frac{1}{8}$  " "

$\frac{1}{8}$  " "

$\frac{3}{8}$  " "



**For Standard I.**—Less help should now be given, and only sets of three lines should be used, one for heights and one for the ordinary letters. The size of the writing should be reduced, and the spacings between sets of lines should be less. This ruling will suit Standard I. also in an Infant School, or any class approximating to the work of Standard I. The line for the joins may or may not be retained, but where possible it ought to be omitted. If retained this gives two alternative forms for threefold ruling; one as in the specimen given below, and the other consisting of the two thick lines, with a centre faint one for the joins. The one system fixes the heights and depths of long letters, the other the joins: and as there are many more joins than heights the method of joins is probably the better.

$\frac{1}{4}$  of an inch.

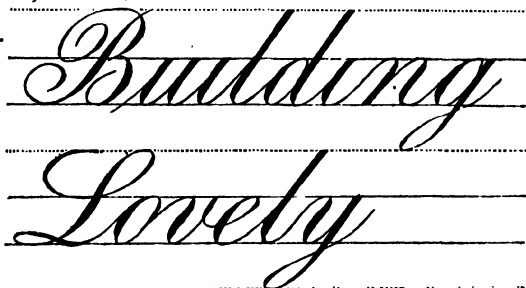
$\frac{1}{4}$  "

$\frac{1}{4}$  "

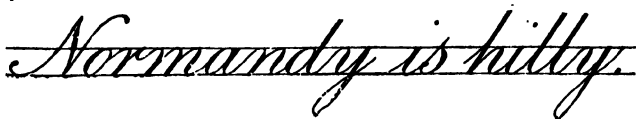
$\frac{1}{4}$  "

$\frac{1}{4}$  "

$\frac{1}{4}$  "



**For Standard II.**—The ruling should now simply be two lines, at such a distance as gives what is called a large small hand. Such ruling is found in some of the blank copy books, and is generally spoken of as double lines. A specimen follows:—



**Other Standards.**—These should be left to the ordinary one-line ruling, as seen in copy books and exercise books. If any assistance is required in correcting faults and giving practice to prevent their recurrence, Mulhauser's rhomboid might be used. But they should be dropped as soon as the correction is fixed.

### EXAMINATION QUESTIONS.

1.—Write as a large hand copy the words "*Geometrical Drawing*," and point out which of the letters are likely to present special difficulties to a young scholar, and what rules should be observed in forming such letters.

2.—Arrange the letters of the alphabet in the order of their difficulty for the teaching of writing; and show how you would group together the easiest of them, for lessons to young beginners.

3.—Show how you would group the capital letters in the English alphabet for teaching.

4.—Show what kind of ruling on the slates and copy books of the younger children is best suited to teach the proper forms and proportions of letters. Give illustrations.

5.—Write six capital letters in such a way as to show the proper forms and proportions of their parts, and say how you would give a lesson on them.

6.—Write the words "*Geographical Analysis*" in text hand, and give rules for the length of the letters *p, h, l*, and *y*.

7.—Explain fully the principles of Mulhauser's method of teaching writing; and write the word "trustfulness" according to that method.

8.—Describe the proper position of the body for writing, the right way of holding the pen, and the best way of setting copies for advanced classes.

9.—What elements are common to the written letters *p, q, h, g, d, y*? In what order, and in what combinations, would you teach these elements to infants?

10.—What are the chief difficulties to be encountered by a child beginning small hand copy? How would you deal with them?

11.—Arrange the following words in order according to the difficulty of writing they present to beginners, and give your reasons: *man, mal, mamma, mask, mast, men, meal, mend, mane, most, mind*.

12.—Show clearly the elementary component parts of the written letters *a, h, g, m, d*.

13.—How would you teach children to write (*a*) on slates, or (*b*) on paper? What are the important points to be attended to in teaching children to write?

14.—Show how you would group or classify the letters of the alphabet for teaching the elements of writing to very young children. Explain by an illustration what use can be made of the system of threefold ruling on slate or copy book.

15.—Say what use you think it right to make of "tracing" in teaching writing. Write in large hand the five capital letters *B, K, Q, M, W*, and point out the commoner faults made by learners in forming them.

16.—Draw up a course to be followed in the teaching of handwriting to each of the classes of an infant school, giving examples of the size and style of the letters you would adopt.

17.—Which do you prefer in teaching writing—engraved copies, or copies set by the teacher on the B.B.? Give reasons for your preference, and write, as illustrations of the true forms and proportions of letters, four capital letters and four small letters such as should be grouped together for the purpose of teaching.

18.—Classify the capital letters according to the similarity of their forms, and the order in which you would teach them. Give specimens of any six capital letters, carefully written, so as to illustrate their proportions and the rules for their formation.

19.—What are the advantages of teaching large hand before small or running hand, and how far is it desirable to continue large hand practice in the upper classes? Give a model copy in each hand.

20.—Give some simple rules showing the best way of conducting a class lesson in writing.

21.—Describe the best way of ruling slates so as to help young scholars to understand the forms and proportions of letters. Give an example.

22.—Describe the way of teaching the children to hold their pencils properly. What are the common mistakes to be guarded against?

23.—In writing in copy books there is a great tendency to repeat the same mistake down a whole page. What is the best method of correcting this?

24.—What is the use of tracing in the earlier copy book exercises, and what are the objections, if any, to the practice?

25.—Write the word "*striding*" in small letters, and point out the mistakes in it which you would watch for.

26.—What use could you make of a threefold ruling of the lines on a child's slate and on the teacher's B.B., in order to show more clearly the forms and proportions of letters and the mode of joining them?

27.—Which of the manual employments of an infant school is most useful as a help in the teaching of writing? Explain and illustrate your answer.

## CHAPTER XII.

### GEOGRAPHY.

#### OBJECTS OF TEACHING GEOGRAPHY.

**I. Primary.**—The practical value attached to a knowledge of the subject must always be considered its primary object, and the chief practical objects are as follow :—

**1. Maps and Plans.**—The pupil is taught to grasp the meaning and use of these, and as they figure appreciably in the everyday life of the people, a right understanding of them is important.

**2. Trade and Commerce.**—England is the greatest manufacturing and commercial nation of the world. If this supremacy is to be maintained, the productive districts and the chief markets, actual and potential, should be known. The quickest, safest, and cheapest trade routes ; the national tastes and requirements of foreign customers ; the sources of our food supply, and many kindred questions also become of vital importance.

**3. Literature.**—Much of our literature, and especially newspapers, assumes a fair amount of geographical knowledge, hence this subject should be taught for the intelligent comprehension of modern literature.

**4. Emigration.**—England is said to be over-populated, and fields for emigration are essential to relieve the surplus population, and to carry out the advisable and beneficent planting of the earth by the English people.

**5. Naval Power.**—England is the greatest naval and maritime power in the world. From this point of view alone the necessity for geographical knowledge is obvious.

**II. Secondary.**—Rightly taught, the subject is interesting, instructive, pleasant, and intellectual. It affords excellent opportunities for intellectual training ; observation, imagination, memory, and reasoning all being cultivated by its teaching. These subjects are dealt with more fully under the next heading.

### GENERAL PRINCIPLES.

If the subject is to be presented to the pupils in an interesting and scientific manner, if the interest is to be maintained, and if the dull and backward children are not to be left in the rear, then there are certain general principles which it will be necessary to observe in its teaching.

**1. Illustration.**—The subject must be profusely illustrated, for this arouses interest and gives life to the lesson. The *B.B.* should be freely used, and *sketches* in coloured chalks introduced where necessary. *Maps* and *diagrams* of all sorts, *apparatus* and *models*, are essential. *Objects of manufactures*, export and import, should be exhibited. Even *reading*, *poetry*, and *anecdotes* may be utilised for this purpose. Treatment of this sort will tend to destroy the still paramount idea among children, that geography is a dry subject.

**2. Intelligence.**—One of the great faults of modern geography lessons is the undue use of the memory involved. Memory will always be necessary, but the higher faculties of the mind should be called into play. The *reasoning* powers of the pupils should be taxed. *Observation* should be stimulated by careful attention to the local physical and political facts. So far as possible, the locality of the school should be made to furnish the illustrations, the instances, and sometimes even the lessons themselves. The pupils will then see things more fully, and with more interest. They will form the habit of noticing things in the best sense of the word. Then, in good lessons, there is plenty of scope for the proper development of the *imagination*, and for this purpose ideas rather than words must be given. Graphic description must be cultivated by the teacher, so that the mental image created by the child may approximate to the real thing described. The mental effort required to form a picture of an Indian forest, or a mine, is greatly aided by good verbal description, pictures, and sketches. There should also be *continuity* in the teaching. Isolated facts have little interest for children, so that each fact should be presented in relation to other facts.

**3. Memory.**—The abuse of geography chiefly rests here. The memory is often overworked, to the neglect of the other faculties involved. The object of the teacher is to get the biggest return for the smallest outlay of memory. Too often there is mere rote work, without any, or with but little intelligence, as in the learning

of strings of bays, capes, or counties. To avoid this we must arouse *interest* by *natural associations*. *Classifications* must be made on the basis of real resemblances. A free use of *comparison* and *contrast*, which present the positive and negative side of the comparative method, should be made, and the assistance of *drawing* and *pictures* should be enlisted; for drawing is a fine aid to the graphic memory, whilst pictures appeal to the pictorial memory, which is good in most children.

Instances of *natural association* would be the joining of certain bays with certain ports; coal fields with manufactures; productions with industries. The *etymology* of the names of places may be given in the higher classes, and some choice may be exercised in the presentation of facts. This choice of facts should be regulated by the following rules:—

- (a) All statistics should be given in comparison with some well-known standard; e.g., all areas might be compared with that of England.
- (b) General statistics should be given in round numbers.
- (c) Special statistics in exact figures.

**4. Reasoning.**—Classifications, generalisations, and discoveries have to be made; cause and effect traced; and the general truths of the subject demonstrated and grasped.

**5. Gradation.**—The first lessons should be very simple, and there should be a careful gradation of subsequent lessons. Familiar terms should be used where possible, rather than technical ones, which could and should be introduced later; e.g., “neck” for “isthmus,” “feeder” for “tributary,” etc. Then the lessons should be short, so that they may be thorough, and they should show a unity of plan. There is always a temptation to digress, and this should be resisted.

**6. Realistic.**—The teaching should be realistic. The children should be encouraged to observe local features, and to describe them orally to the teacher. The child’s knowledge and experience should be used, for this knowledge will form the basis for efforts of constructive imagination when proceeding to the unknown. By the aid of models, toys, apparatus, and specimens, the *real* things, or substantial approximations to them, can be shown. Children can see in this way real miniature mountains, real rivers, real capes, etc.

### FIRST LESSONS IN GEOGRAPHY.

The first lessons in geography should be given as a series of *object lessons* connected with familiar things, and freely illustrated by *pictures*. The children will then commence—as they should—



with the *concrete*, for the elementary notions that form the basis of all true geographical teaching must be gained through the senses, and the subsequent transition to the abstract will then be made with greater ease and success. The more simple objects should be taken first, such as earthenware, iron, wood, tin, coal and chalk. The children should not only see the articles but also handle them, and so all their ideas will thus be accurate and sound. Furthermore, let them name any of the *uses* of these objects, and this will show to them the reason why men take so much trouble to get them. Receive and utilise every answer that is in the least pertinent. The *places* from which they are obtained might be described with the aid of pictures, and the *distance* of each place could be given by estimating the time it would take a person to walk there. The manner of bringing them—train, road, river, or ship—could then be pointed out.

Such a course as this will necessarily involve lessons and explanations of the various geographical *definitions*, and these could be taught realistically.

The *productions* of our own land should next receive attention—animal, vegetable, and mineral. These could subsequently be compared with the *productions of other countries*, the better known being taken first. These lessons on other lands will require efforts of *imagination*, which will thus get material supplied for fresh constructive efforts.

Finally, the lessons might embrace the people, their trades and occupations, their customs, their food, clothing, habits, etc.; and these again in their turn should be compared with those of other countries.

## PLANS.

**I. Simple Plans.**—The teacher's first task is to give the children an accurate idea of what is meant by a plan. For this purpose a number of simple and suitable familiar objects should be used for demonstration. The lesson will require some such graduation as follows, commencing with the dot or point, and finishing with some simple geometric solid or common object. It is not advisable at this stage to bother about scale. It will be sufficient for the present to simply preserve a general proportion, the children aiding by suggesting as much as possible the drawing of the lines.

A plan is properly the representation of anything drawn on a

plane, and in a special sense it is the representation of a horizontal section of anything. The teacher's task is to convey this information in simple language and by suitable demonstration. On no account should such a definition be given to the class; but explanation and demonstration by the teacher should be followed by a simple description from the class. It is advised that an attempt be made to develop the idea by some such method as follows:—

### 1. First Ideas.

(a) The children take their slates and pencils. Each one is instructed to make a *dot* on his slate, the teacher doing likewise. The teacher then brings his eye in a direct line over the dot on his slate, and invites the class to do likewise. They are then asked to describe what they see—a *dot*. That is called the *plan* of a dot.

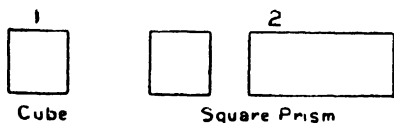
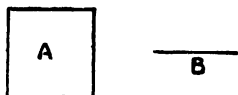
(b) The teacher next takes a *knitting needle* or something similar. It is held in a *horizontal position*, and is brought in a direct line beneath the eyes of several of the boys. They are again invited to describe what they see—a *straight line* (B). That is called the *plan* of the *knitting needle*. The teacher draws the plan on the B.B., and directs the class to draw a similar plan on their slates. The needle is then held *vertically*, and the same process is followed. This time they see only a *point* or dot. That is the plan of the needle in a vertical position (A).

(c) A *square* piece of paper or cardboard is next taken. The same method is adopted. The square is first held horizontally in a direct line beneath the eye; the class is invited to name what they see; the plan is then drawn on the B.B. by the teacher, and the class are instructed to draw the plan (A) on their slates. The figure (A) is called the *plan of the square*. The square is next held in a vertical position; the same steps are gone through, and the plan is recognised as the figure (B).

(d) Other figures should be treated in a similar way, great care being taken to see that they are carefully graded, and that the one more or less naturally suggests or leads to the other. Where the figure has two views, or two simple plans, each should be dealt with. The order recommended is as follows:—

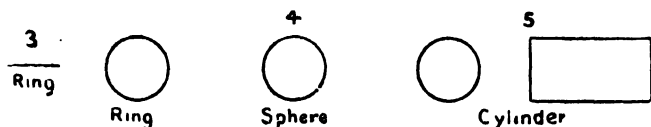
•      ———

A      B



Cube

Square Prism



Ring

Ring

Sphere

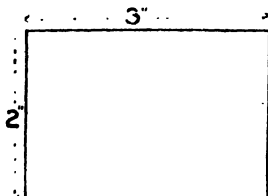
Cylinder

**2. Transition Objects.**

- (c) The class will now be ready to proceed to the *table* and the *floor*. Hitherto the objects have been smaller than the B.B. Now they are probably as large in one case, and certainly larger in the other. There has been no drawing to scale up to the present, only a rough proportion being observed. The table and the floor form an easy and suitable transition from smaller to larger plans; from simple to more complex objects; from scaleless drawings to drawings to scale.

**II. Plans to Scale.**

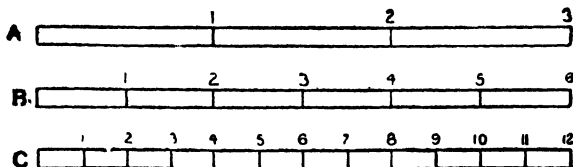
- (a) Draw a plan of the school *table*. To the children it is obviously too large to be drawn full size. It must be drawn smaller than its real size. Hence arises the necessity for *scale*. But the teacher is advised



to avoid the word at present. We can draw it half, or one-quarter, or one-twelfth its real size. Let a couple of boys come out and measure the table—one its length and the other its breadth. Supposing the dimensions to be 3 feet by 2 feet, and it is decided to draw it one-twelfth its real size; some members of the class will be able to tell you that there are twelve inches in a foot (if not, tell them), and that therefore every foot will be drawn in the plan as one inch. Hence the drawing

will be 3 inches by 2. Draw the plan on the B.B.; then serve out flat geometric rulers, and tell *each member of the class to draw the plan on his slate*. The teacher should then test the plans by sample and correct where necessary.

- (b) The class will now be ready for the word *scale*. Tell them that such a drawing is said to be made to scale, and that in this case the scale is said to be *one inch to the foot*. Now explain, demonstrate, question, and exercise the class until they can grasp such representations of scales as follow:—



**Scales of Feet**

Draw the scale A upon the B.B. Tell the class it represents three feet. Measure it—it is 3 inches. Then every inch represents 1 foot, and the scale is said to be *1 inch to the foot*.

Next draw the scale B on the B.B. Tell the class it represents 6 feet. Measure it—it is 3 inches, or 6 half-inches. Then every half-inch represents a foot, and the scale is said to be *a half-inch to the foot*. Deal with C in the same way, which will be found to be *one quarter of an inch to the foot*.

The class should now be exercised on their slates in drawing easy scales to the teacher's dictation, every exercise being demonstrated on the B.B. and then corrected by the teacher.

- (c) They are now ready for the next step, *viz.*, to draw a plan of the *school-room floor*. Measure up the floor. Suppose its dimensions to be 40

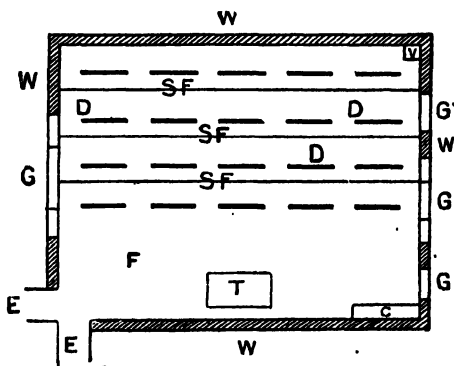
feet by 24 feet. Let the class suggest the scale. If unsuitable scales are suggested, correct and explain their unsuitability. Take one quarter of an inch to the foot as your scale. Then ask the class to give you the length of the lines—10 inches by 6 inches. Correct and explain all errors. Then draw the plan on the B.B., and afterwards let class draw it on their slates. Suitable exercises should follow this step, as in other cases, and such exercises should be varied.

- (1) The dimensions should vary with the same scale.
- (2) The scale should vary with the same dimensions.
- (3) Both scale and dimensions should vary.

**III. Plans of the School and District.**—The class should now be ready to draw with intelligence those plans laid down for them in the Code. The order to be observed naturally suggests itself, and should be adhered to, *viz.* :—

1. Plan of the classroom.
2. Plan of the school.
3. Plan of the school district.

**1. Plan of the Classroom.**—It will be advisable in every case for the teacher to make a plan of his (or her) own classroom. The room and its furniture should be measured up in the presence of the class; the dimensions should be dictated to the class as they are made, to be written on their slates, and then the plan should be drawn on the B.B., the dimensions being given by the

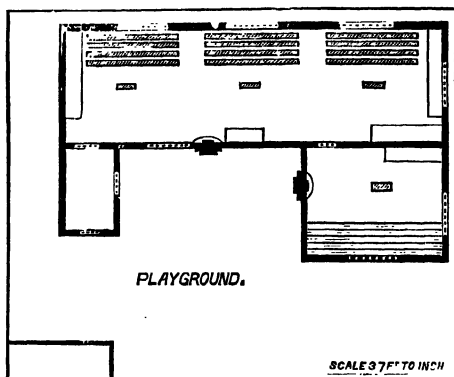


children. The children should then be directed to copy the plan on their slates, learning the dimensions at the same time. They should also be taught to affix a lettered description. It is perhaps unnecessary to remind the teacher that ornateness and superfluous detail should be omitted. The plan must be simple, so as to bring it within the understanding and slender artistic capacity of the children. The size of the room will fix the scale.

*Lettered description—*

W	equal Walls,	G	equal Windows.
E	" Doors.	F	" Floor.
SF	" Stepped Floor.	D	" Dual desks.
C	" Cupboard.	V	" Tobin ventilator.
T	" Table.		

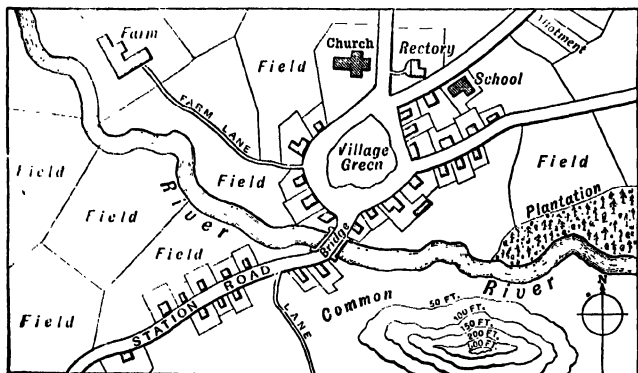
**2. Plan of the School.**—This can be dealt with in exactly the same way as the plan of the classroom. There is more work, but the process is exactly



the same. The drawing should be neatly done, roughly to scale, and the points of the compass should be inserted to denote the aspect of the school.

**3. Plan of the School District.**—The process is still the same, with two exceptions:—

(a) The scale is only approximate, and is roughly guessed very often,



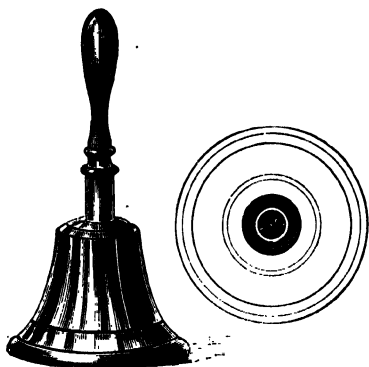
although there is no reason why it should be so. The teacher could make a drawing to scale from some copy, and then dictate the dimensions.

(b) The scale has to be very small because of the wider area covered, and the cardinal directions of the various roads and streets have to be known and shown.

**IV. Maps and Plans.**—Perhaps the chief object in teaching

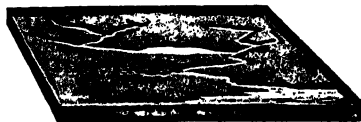
plans is to give the scholars an intelligent idea of the map. In this sense all these lessons on plans are preparatory lessons to map drawing. The connection between the two must be pointed out and used, and subsequently their differences demonstrated. Lead gradually up to the more difficult conception of a map, and for this purpose proceed as follows :—

**1. Draw a Plan of Some Simple Objects.**—Lay the B.B. on the school table and draw the plan on it in this position—say of the *pencil box*, or a *slate* or *ink-stand*; or, better still, draw the plans of all of them. Then place the B.B. on the easel. The children see the point at once. The B.B. should really lie in a



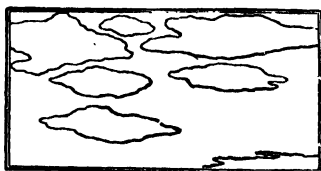
horizontal position. Why does it not? Then the vertical position on the easel is a mere matter of convenience, to enable all the class to see more easily and more effectually.

**2. Draw a Plan of a Flat Geographical Model.**—Get some clay and some water. Spread out a thin surface of clay in a shallow trough. Mark out the course of a *river* and a *lake* in the clay, and pour a little water into them. Again lay your B.B. on the table or on the floor, and draw the plan of the



model. As this will be the first irregular object submitted to them for its plan to be drawn, a little more assistance may be required. Then, as before, raise the B.B. on the easel, and let the children compare the object with its plan. Represent the river by a line only, as in that form they are found on the map.

**3. Draw a Plan of Some Mountains.**—Make models of *several mountains* upon the table, in sand or clay. Place the B.B. on the table or floor again. Let several of the scholars come out, look straight down on the model, and then say what they see. A little more illustration may be necessary here. Give as



much as is required. Then draw the plan, and raise the B.B. on the easel. The model and the plan should then be compared by the class. The teacher should now sketch the methods adopted to represent mountains in maps, and should then ask the class to point out some mountain on a school map which could be placed in front of the class. They might also be asked to point out any lakes or rivers on the map.

**4. Combined Plan.**—A model might now be rapidly made showing *mountains, river, and lake*.



*mountains, river, and lake.* This should be explained in the same way as the other plans.

**5. Insert the Points of the Compass.**—The points of the compass—N., S., E., and W.—should now be fixed upon the plan. For this purpose the B.B. should be placed on the table or floor with the top of the B.B. pointing the same

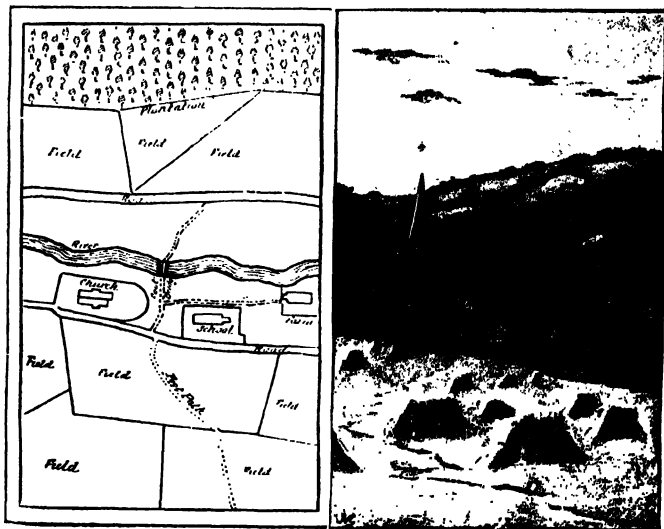
way as the N. point of the compass. This can easily be done, as the compass points are usually painted upon the ceiling of the schoolroom. If not, fix the S. point first, and proceed as directed in the lesson upon the points of the compass.

**6. Lines.**—These might now be taught and explained. A plan of the table could be drawn again, and lines at regular intervals could be drawn on the table both lengthwise and crosswise. Their use could then be indicated. Number them. Let the class imagine that the table represents an ocean. The lines help to define a position, and to locate it. Apply this illustration to maps. Be careful to explain that the lines are mere matters of convenience, that they exist on the maps and globes only, and are not found on the earth itself. A blank map might next be taken, and lines drawn upon it, and their use will be obvious.

**7. Scale of Miles.**—The class will easily understand now that maps are drawn to scale. The scale of miles affixed to every map might now be pointed out, and some useful exercises given.

- (a) The teacher to find out the scale to which the map is shown. Suppose the line showing scale of miles to be three inches long, and to represent 6 miles. The class will at once see that the scale is half an inch to the mile.
- (b) The teacher might take some well-known towns and measure their distance from London. Assuming the scale to be one quarter of an inch to the mile, the teacher measures the distance between the two places and finds it forty inches. The distance is then 160 miles.

## V. Difference between a Map and a Picture.





Map.	Picture.
<ol style="list-style-type: none"> <li>1. A map is a <i>plan</i>.</li> <li>2. A map has not the same effects of light and shade as a picture.</li> <li>3. A map shows a view from one particular position from above.</li> <li>4. A map has imaginary lines, such as latitude, longitude, etc.</li> <li>5. Roughly speaking, a map appeals to the eye only.</li> </ol>	<ol style="list-style-type: none"> <li>1. A picture is an <i>elevation</i>.</li> <li>2. Both may or may not have colour, but the picture excels in the other respects.</li> <li>3. A picture shows things and places as they appear to the eye in <i>general</i> positions.</li> <li>4. A picture has no such lines.</li> <li>5. A picture appeals to the eye and to the emotions. Both map and picture may appeal to the taste, but the picture will do so to a greater degree.</li> </ol>

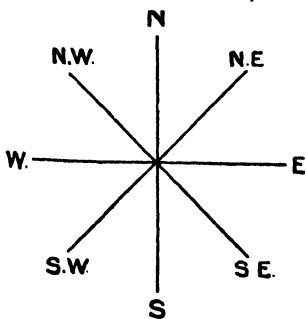
### HOW TO TEACH THE POINTS OF THE COMPASS.

**1. Fix the South.**—Wait for a suitable day, and then turn to the sun at mid-day. Explain south as meaning the sun quarter, and from this find all the other cardinal points in the following order: N., E., and W. Do *not* start with the N.

**2. Fix the Directions in the Schoolroom.**—Mark them, with their initials, on the floor or walls. In London Board schools they are painted on the ceiling. In Glasgow they are fixed by means of brass bars inserted in the granolite at the school threshold.

**3. North.**—Show how the top of the map is N. To do this lay the B.B. on the floor, and mark there the true directions thus found. Then place the B.B. on an easel, and show how N. comes to be at the top, but explain that N. does not mean up higher than the rest; that the existing arrangement is merely one of convenience.

**4. Other Points.**—Explain the principle of naming the other points. Describe each by means of the two bounding it; *e.g.*, N.E. means some spot between the N. and the E. It is both N. and E., and is therefore said to be N.E. So with the other points, N.W., S.W., and S.E. Then proceed to finer differences such as W.N.W.; *i.e.*, between W. and N.W. In this way work out all the points of the compass.



**5. Compass.**—The compass itself should now be introduced

to the class. Explain the word compass by showing that its points *compass the circle*, and the earth is circular in shape. The class will then see why its points are called points of the compass. Deviation and the magnetic qualities of the compass should form a later lesson. A "model" compass might be built by the teacher in front of the class, and with a little preparation and ingenuity each child might also make one at the same time.

### SHAPE AND SIZE OF THE EARTH.

**I. Its Shape.**—This has to be taught to children in Standard II., but its position in the syllabus is a mistake. Children are not as a rule capable of making the necessary inferences from the only facts or illustrations that can be presented to them. The following proofs are usually given :—

1. The disappearance of ships beneath the horizon.
2. The earth's shadow on the moon.
3. The shape of the sun and the moon.
4. The circular shape of the horizon.
5. A greater altitude means a greater horizon.
6. Going "round" the world.

The railway proof is omitted as being beyond the average child, and more or less this is true of some of the other proofs. Pictures or sketches should be shown in illustration of each proof.

**II. Its Size.**—The size of the earth is never much more than a mere abstraction to the young children of Standard II., whatever the teacher may do in the way of objective teaching. The estimation of size is defective in most people, and in children especially so. The information imparted will embrace the size of the *circumference*, the *two diameters*, the *total area*, the *area of the land*, and the *area of the water*. The earth might also be roughly compared with the size of the *sun* and *moon*. But *time* will be the chief aid to the teacher, and the best impressions of any large area will be gained by stating the time it would take the class to *walk* over it. The size of the various objects in the room should be estimated and measured if necessary. The estimates could then proceed to the school, the street, the town, and so on, leading finally up to the size of the earth. As soon as you get beyond the town or the village, you transgress the bounds of their experience; hence any reference to county, country, or continent is not recommended. It is a mere attempt to measure one abstraction by another. If railway journeys are used as the standard, they are the experience of the few, and are rarely

coincident. Then follows the necessary correction to the staple test of walking, and an extra and superfluous difficulty is thus added. In estimating these mighty distances, the deepest and most intelligent impression is made by an illustration or experience within the knowledge and grasp of all.

### GEOGRAPHICAL DEFINITIONS.

So far as possible, these should be taught *objectively*. A free use should be made of *models*, which should be the work of the teacher or some member of the class. *Pictures* and *diagrams*, of which there are now plenty in the market, should be brought in to assist. In every case the teacher is advised to commence the lesson with an effort to develop the idea of the particular land or water division to be defined, and to furnish plenty of examples so that the definition when it comes should be the work of the class itself. The completeness and accuracy of the definition or description given by the children will be the measure of the teacher's success. Any errors should lead to a recapitulation of that portion of the lesson which is responsible, and such recapitulations should be given until the class shows a sound and accurate idea of the subject of the lesson. A lesson on Capes follows as a typical illustration of the method of giving these lessons, and the adoption of some such style of teaching will enable the young teacher to remove that dull, mechanical, rote aspect which has been so characteristic of these lessons in the past.

#### A CAPE.

*Apparatus* Shallow dish, clay, water; picture of a cape; Maps of England and Ireland; a bird's bill (if possible); B.B.



#### I. Develop the Idea of a Cape.

1. By the aid of a shallow dish, some clay, and some water, develop the idea of a cape.

2. Show a picture of a cape. Compare with model. Note that the cape is *small* compared with other portions of land.

3. Ask class to define a cape.

**A cape is a small piece of land stretching out into the sea.**

#### II. Kinds of Capes.

1. Take some clay and rapidly make rough small models of—

a. A Cape.  
d. Head.

b. Bill.  
e. Foreland.

c. Naze or Nose.  
f. Point.

*Note—*

1. Explain each in its turn and as it is made.
2. Take your models from the map of England and of Ireland.
3. Point out the cape on the map in each case. Then tell the class that you are going to make a model of it.

2. **CAPE**—Model of this as already made (I. 1). Point out on map of Ireland Cape Clear. Explain term.

Word *cape* comes from a foreign language. It means *head*. Refer to the capes worn by people, and tell that formerly these capes used to have a covering for the head attached to them. They are still worn on the Continent. They were considered *head* coverings rather than body coverings. Point to the position of their heads with respect to their bodies. They stick out from their bodies.

3. **BILL**—Point to Selsea Bill and Portland Bill. Make an enlarged drawing of the latter on the B.B., and mould the model from it.

*a.* Point out its resemblance in shape to a bird's bill. Sketch a bird's bill, show a picture of one, or better still, show a bird's bill if possible. Then compare the cape and the bird's bill.

*b.* Point out the position of the bird's bill with respect to the rest of the body. Compare with the cape. The meaning of the term is then obvious.

4. **NESS**—Point to the *Naze*, *Foulness*, *Dungeness*, *Hope's Nose* (near Torbay). *Naze* (a foreign word for *Nose*), *Ness* (shortened form). Make a model of *Hope's Nose*.

*a.* Note the rough resemblance of the cape to the human or animal noses.

*b.* Note the position of the nose with respect to the face.

*c.* Infer the suitability of the name.

*d.* Say a few words about the hardy Norsemen of old, who call the "*nose*" *nase*.

5. **HEAD**—Point to Flamborough Head, Spurn Head, Beachy Head, etc. A common name for English capes.

The idea of "*Head*" has already been developed under "*Cape*". It has been suggested that when at sea a piece of bold projecting land often looks like a great beast lying down with its head to the sea, and that it was some such fancy as this which led sailors in early days to call such pieces of land "*heads*" or "*headlands*".

6. **FORELAND**—Point to N. and S. Forelands. Take a bit of clay and affix it *before* or in front of the mass of clay. This will illustrate a *foreland*.

7. **POINT**—Hartland Point, Start Point, etc. A common name for English capes.

The previous names are based on fancied likenesses. In this name there is not only likeness, but proportion or magnitude also. Compared with the great mass of land, a "*Point*" is a very small area indeed.

### **HILLS AND VALLEYS.**

These should be taught together, for each is the natural complement of the other. They should be taught objectively. For this purpose a clay model of some well-known or suitable district should be made, such as the Downs of Kent and Surrey. The map should afterwards be brought into use, and well-known ranges of hills with their adjacent valleys, should be pointed out

and briefly described. In making out the notes of lessons on such a subject, the model should be sketched and the map drawn.

The common experience of the children, as based on observation, should be utilised. Every shower of rain affords material for the teacher. The wearing effect of the rain upon the roads can be pointed out, or rather drawn from the children. A little suggestive questioning will suffice. Rain water is tolerably pure; but the streamlets running from the roads into the gutters are dirty or muddy. The children will see at once that the rain is thus wearing away the road. A reference to the usually worn condition of ground beneath a water tap, a pump, or a spout will illustrate the same thing. A reference might also be made to the beds and channels of rivers, although, so far as the Code is concerned, perhaps this reference would be a little too premature. On such concrete examples as these the imagination might fairly be set to work to conceive the vaster and mightier effects as displayed in the formation of valleys. The connection between hills and valleys will thus be demonstrated.

Other forces assist. The rain and the river have their auxiliaries. The frost hardens, cracks, and loosens the surface material, and sometimes acts in mightier ways still. Snow is another agent. As frozen rain, it does much the same work as rain in swelling the volume of our rivers and lakes; in wearing away our roads; and in mountainous districts bringing down masses of earth and rock sometimes in its avalanches. In its frozen and condensed form, layer upon layer accumulating through centuries, it forms the glacier, which is a mighty manufacturer of valleys. The tides, with their persistent wash of the ebb and flow, are another denuding agency.

Land is sometimes elevated by internal forces. This is a positive force in the formation of hills, and instances of raised districts (*e.g.*, sea beaches) should be given.

The transition from hills to mountains is easy and natural. After hills and valleys are thoroughly understood, lessons on mountains should be given. These lessons may be given from different standpoints, but one method is suggested in the following sketch:—

**MOUNTAINS.**

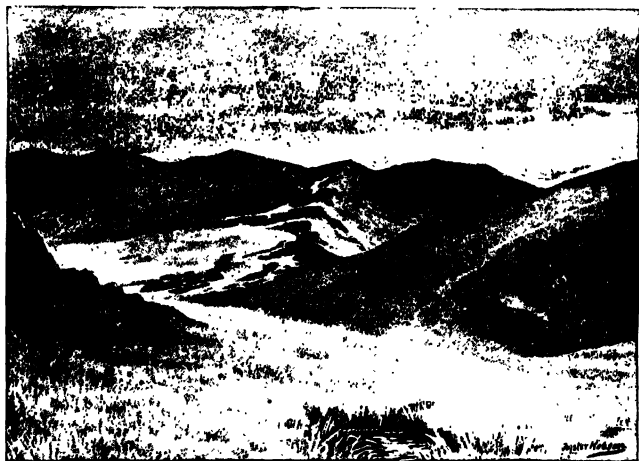
*Apparatus*—Model of hill, of England, pictures of mountain scenery, Map of England.

Very few English children will have seen a mountain, but many will have seen a hill. The object of this lesson is to endeavour to get the children to form by constructive imagination a correct mental image of a mountain.

**I. Development of the Idea of a Mountain.**

1. Get the children to name a hill or hills in the neighbourhood of the school. Ask how long it takes them to get to the top. Now endeavour to get children to imagine a "hill" so high that three, six, twelve, or more hours are required to reach its summit.

2. In the early morning or on a dull day, the children may

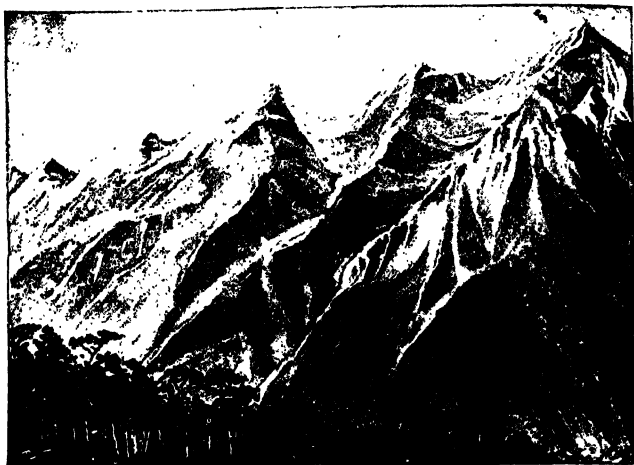


have noticed a cloud resting on the top of the hill. Picture a "hill" so high that a cloud rests on its summit even on some fine days, and, if possible, show a picture of a mountain partly covered with clouds.

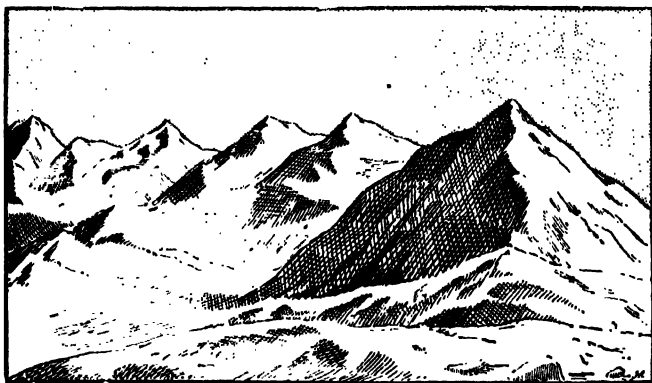
3. The children may have observed that the grass, etc., does not grow so freely on the top of the hill as in the valley. Describe the ascent of a very high "hill," the gradual stunting and final disappearance of the trees, the gradual disappearance first of grass and then of moss, and lastly a summit absolutely bare of vegetation.

4. The children may have observed that in winter the snow often remains on the top of the hill some time after it has melted

in the valley, or they may have noticed that the top of the hill is white with frost or snow in the early morning when there has been no frost or snow in the valley beneath.



5. Summarise by drawing a word-picture of a very high "hill," the ascent of which takes some hours, which has a summit some-



A Chain of Mountains.

times enveloped in clouds, bare of vegetation, and covered the whole or the greater part of the year with snow. The term "Mountain" may now be taught.

6. Show some pictures of mountains; also of parties of mountaineers making ascents, etc. Vividly describe the ascent of a snow mountain.

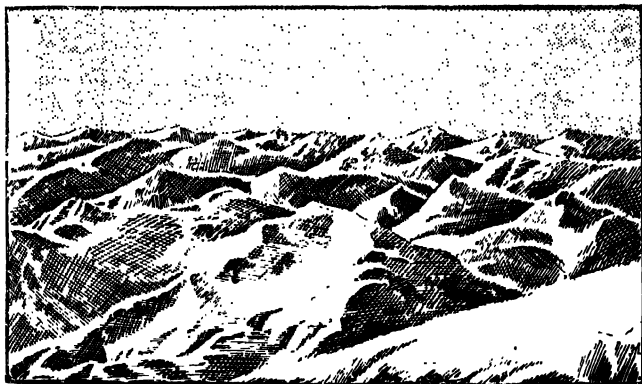
*Definition*—A mountain is a very high hill.

## II. Examination of the Model of England.

1. Direct attention to the model, and get children to see that the mountainous parts of England are in the north and west.

2. Point out the position of Snowdon. Show picture. Let the thickness of one book represent the height of the church spire (say 100 feet), then take five books to represent the height of the nearest hill (say 500 feet), and lastly pile thirty-five books against the wall to represent the height of Snowdon.

3. Get children to observe that some of the mountains in the model are arranged in a "line," some in a "crowd" or "ring".



A Group of Mountains.

Teach the terms **Chain** and **Group**. Sketch a chain and group on B.B. Have the positions of the chains and groups of mountains in England pointed out.

## III. Examination of Map.

Show how mountains are marked on the map.

*Note*—The term "Watershed" may be taught in connection with term "Chain".

## B.B. SUMMARY.

**A mountain is a very high hill.**

**Some mountain tops are always covered with snow.**

**A mountain chain is a line of mountains.**

**A mountain group is a crowd of mountains.**

**Snowdon is the highest mountain in England and Wales.**



## RIVERS.

The chief points to be noticed in giving a lesson on rivers are here enumerated, but it is not suggested that *every* lesson should contain all the information specified. The time allowed and the class must be the chief determining factors. The points should always be introduced in the order recommended, so as to preserve the proper sequence in teaching—from the more known to the less known. Children may see a river day by day, and may also see its various uses exemplified. They probably know little or nothing about its formation, and therefore this should generally come last. We will take the Thames as an example.

**1. Uses.**—It is a great *commercial highway*; ships laden with goods from all parts of the world pass up and down it continually. Many *trades* are carried on along its banks, whilst with its steamboats it affords a pleasant means of *communication* between one place and another. It contributes to the *water supply* of the people, for some companies draw largely from it; whilst the fish caught at its mouth and in its upper courses increase the *food supply*. In its prettier parts it is even used as a *residential place*, for many *house boats* are now found upon it. It also affords opportunities for swimming, rowing, sailing, punting, and fishing, while pleasure parties by steam boats or rowing boats swarm upon it. These facts show its *recreative* use to be one of the most important.

**2. Course.** Follow the course from its source to its mouth, and take the opportunity to teach right and left banks, shore, bed, channel, tributary, mouth, course, basin, estuary, chief towns, bridges, tunnels, and chief ferries.

**3. Formation.**—Describe the circulation of water on the globe—evaporation, condensation, atmospheric phenomena (rain, snow, etc.), the percolation of rain, and the formation of springs. For other rivers it may be necessary to describe the formation of a glacier, and to show that some rivers take their rise from them.

## THE BUILD OF A COUNTRY.

In teaching the “build” of a country, first make the class thoroughly understand that the term means the “make,” “form,” or “physical construction” of a country. It will thus practically embrace the physical features of that country; e.g., extent, length of coast line, chief capes and bays, rivers, mountains, lakes and plains. The ordinary method of teaching this branch of the work is bad. Lists of capes, bays, islands, rivers, etc., taught as mere strings of names, with an utter absence of objective and realistic teaching, are worse than useless. Abstract numbers to express extent are very often meaningless. Some district should be taken as a standard, and other countries com-

pared with it. The coast line should be taught by a series of descriptive voyages with the aid of the map and B.B. sketches. Mountains might be compared with some well known or neighbouring hill. Pictorial illustrations, where possible, should be brought into requisition. Boating parties could traverse the rivers if the imagination of the class is properly appealed to, and stimulated by the descriptive powers of the teacher. Mountains could be climbed in the same way, and the views thus revealed described. The narrative element thus introduced would remove the dulness of the usual lesson. On such a method as this a number of geographical problems would naturally suggest themselves, and would aid the training of the faculties of observation and reasoning. For instance, the influence of "build" upon the health, tastes, sentiments, and industries of the country could be deduced. A mountainous people are of an independent nature, and generally religious. Why? The capacity to deal with questions of this sort would be cultivated and developed by the methods suggested. Each item in the "build" would thus become a central objective fact, around which could be grouped a number of vital incidents in the life of the nation. Such work, it is true, will require more thought and preparation than usual, but the outlay will be found a productive one for all concerned.

### HOW TO TEACH LATITUDE AND LONGITUDE.

**1. Show their Necessity.**—Take a suitable ball. Make a mark A upon it, and then ask the children to locate the mark. They cannot. Let the ball represent the earth, and suppose this spot to be placed in some ocean or desert. *They cannot locate it because they have no starting point to fix its relative position.*

**2. Find a Starting Point.**—For this purpose it will be necessary to fix the polar points and to draw an equator. Proceed as follows:—

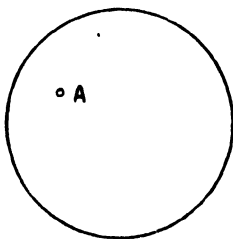


FIG. 1.

(a) **Fix the Polar Points.** Take a piece of wire of suitable length and run it through the centre of the ball. Then make the ball revolve on this line, which is called an **axis**. Refer to the axis of a cart wheel as an illustration. The ends of this line are called **poles**. A pole means a

pivot, and the class will see the appropriateness of the name. The children *can* fix the spot A now by reference to its distance from either pole. But it can be fixed more precisely than that.

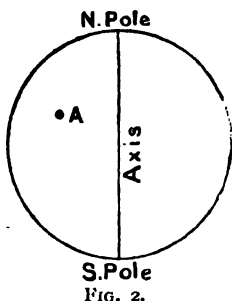


FIG. 2.

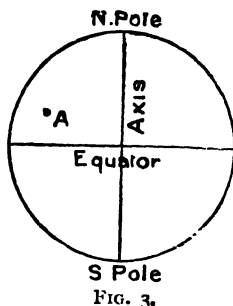


FIG. 3.

**Draw an Equator.** Compare the word "equal" with *equator*, and tell the class the line is so called because it divides the earth into two equal parts. The point A can now be better located. Its distance from the equator can be given as well as its distance from the poles. Measure its distance above the equator. **This distance is called latitude.**

**3. Latitude.**—The class can now define latitude as **distance from the Equator north or south.** Draw a line through the point

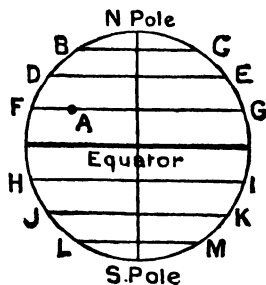


FIG. 4.

A *parallel* to the equator. This is called a **parallel of latitude**. There can be any number of them, as BC, DE, etc. Any spot we may wish to locate will have one of these parallels of latitude drawn through it, so as to fix its distance from the equator. The lines go right round the earth parallel with the equator, and *all places on the same line have the same latitude.*

**4. Degrees.**—The earth is 25,000 miles round the equator, which is divided into 360 parts. Each part is called a *degree*. Make the class quite understand that this is an arbitrary number, and it might have been 100, 500, or anything else. It was chosen because it is divisible by all numbers from 1 to 12 except 7 and 11. This fact should be told. A little problem then might be given asking how many miles there are in a degree at the equator, *e.g.*,  $25,000 \div 360 = 69\frac{39}{100}$  miles. Then let the class compare the parallels of latitude with

the equator—they decrease as they reach the poles; but as every circle on the globe is divided into  $360^\circ$ , the number of miles in a degree on a parallel of latitude varies with its position. At London, the number of miles in a degree on London's parallel of latitude is about 42; at  $80^\circ$  it is 12 miles.

Take a globe, point out the parallels of latitude and their decreasing size towards the poles, and so demonstrate these facts practically. Where a globe is not available use a sphere from the drawing models or an ordinary ball.

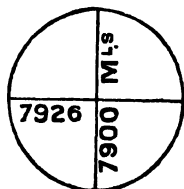


FIG. 5.

**5. Longitude.**—Ask the class to tell you how far east or west the spot A is. They cannot, because they again have no starting place. Suppose we fix on some place as a starting point—say Greenwich.

The choice again is an arbitrary one.

Now we can say how far east or west A is from Greenwich.

If G be the position of Greenwich, draw a line round the ball passing through the two poles and the point G. This line is called a

**meridian**, because all places along it have midday at the same time. Draw a

diagram on the B.B. illustrating this. All the places a, b, c, d, e,

along the meridian N.S. have midday at the same time. **Meridian,**

**then, means midday**

**line.** Now we can say

that the point A is so far (measure distance)

west of Greenwich. This line through Green-

wich is called the *first*

*meridian*, because it is

the point fixed upon to

start from. The class

should now give a de-

finition of longitude.

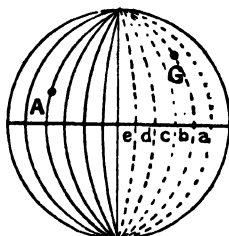


FIG. 6.

Now we can say that the point A is so far (measure distance) west of Greenwich. This line through Greenwich is called the *first meridian*, because it is the point fixed upon to start from. The class should now give a definition of longitude.

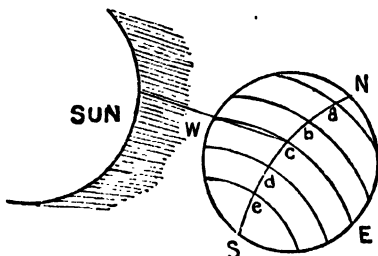


FIG. 7.

**6. Meridian Lines.**—Mark points along the equator at equal distances (Fig. 6). Through these points and the poles draw circles. The children should be invited to notice that they are

not parallel, hence *there are no parallels of longitude*. The circles are called meridians for the reason given. These meridians are also divided into  $360^\circ$ , but as they are all the same size, **a degree on a meridian of longitude always contains the same number of miles.**

**7. How to find Latitude and Longitude.**—The position of A will be fixed by drawing through it —

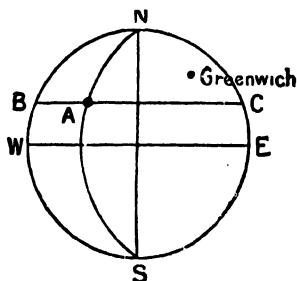


FIG. 8.

(a) A parallel of latitude BAC.

(b) A meridian of longitude NAS.

The intersection of these two lines at A locates it. The spot A is so many degrees W. longitude, and so many degrees N. latitude. But when a ship is at sea, it is not possible to *measure* this distance, as children usually understand the word *measure*. Explain the method adopted as follows:—

(a) **Latitude.**—This is fixed by the relative position of the polar star by night, and by the altitude of the sun by day.

1. **By Night.** Tell the class that the pole star is always the same number of degrees above the horizon as the observer is removed from the equator, so that the height of the pole star gives the latitude of the observer. Now, the height of the pole star *can* be measured. (Reserve the method how for another lesson.) If a person travelled  $10^\circ$  northward, the polar star would appear to rise  $10^\circ$ .
2. **By Day.** The measurement is most often made by day, and then the altitude or height of the sun is used instead of the pole star.

(b) **Longitude.**—All ships carry chronometers. These keep accurate Greenwich (the starting place) time. Suppose the height of the sun shows it to be 10 a.m. where the ship is, when it is 3 p.m. by the chronometer. A distance of  $15^\circ$  is allowed for each hour, because  $360^\circ \div 24 \text{ hours} = 15^\circ$  for each hour. Then the longitude is  $15^\circ$  for every hour's difference in the two times; *i.e.*, it is  $5 \times 15^\circ = 75^\circ$  W. longitude. The longitude is W., because the time by the sun is in *advance* of the time by the chronometer. Again, suppose the sun to show it to be 4 p.m. and the chronometer 10 a.m. Then the longitude  $6 \times 15^\circ = 90^\circ$  E., because the time by the sun is *after* the time by the chronometer. Give plenty of examples, and do not forget to tell the class that all these lines are *imaginary*.

**A LESSON ON DAY AND NIGHT.**

Such a lesson as the following will need to be preceded by a certain amount of preliminary work, *e.g.* :—

1. An easy conversational lesson to remind the children of the *varying lengths of the days and nights*, *e.g.* :—

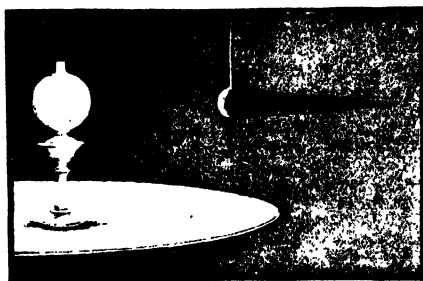
- a.* Summer : long days and short nights.
- b.* Winter : short days and long nights.
- c.* Spring : lengthening days and shortening nights.
- d.* Autumn : shortening days and lengthening nights.

2. A lesson teaching *East and West*, which should connect the day with the sun and the night with the absence of the sun.

3. A lesson on the *Shadows cast by the Sun*, associated with the fact that the sun is higher in the sky in summer than in winter.

*Apparatus*—Candle or lamp ; ball on knitting-needle ; cone of black paper to represent shadow.

- Note*—The experiments should be worked on a dark afternoon. They can be repeated in the light by using the cone of black paper to represent the shadow.



Observations and Experiments.	Results.	Inferences.
<p>1. (<i>a</i>) Place ball before lighted candle or lamp.</p> <p>(<i>b</i>) Note the direction and shape of the shadow.</p> <p>(<i>c</i>) Substitute the cone of black paper for the shadow.</p> <p>(<i>d</i>) Let the ball represent the earth and the candle or lamp the sun.</p>	<p>Half of the ball is illuminated by the light, half remains in darkness.</p> <p>The shadow is away from the light, and is conical in shape.</p>	<p><b>If the earth and the sun were quite still, half of the world would have perpetual day, and the other half perpetual night.</b></p> <p><b>But this does not happen.</b></p> <p><b>Therefore either the earth or sun moves.</b></p>

Observations and Experiments.	Results.	Inferences.
2. Stick several pins in the ball; let the ball remain still; move the light round it at a uniform rate.	Every part of the ball is lighted up during half the time the lamp is moving round the ball.	<b>The motion of the sun round the earth might be the cause of day and night.</b>
3. Let the light remain still; rotate the ball on its axis, keeping its axis perpendicular.	Every part of the ball is lighted up during half the time of one rotation.	<b>The rotation of the earth on its axis might be the cause of day and night.</b>
4. Review the apparent daily motion of the sun.	The sun rises in the east and sets in the west.	<b>It seems as though the sun moves round the earth, and thus causes day and night.</b>



5. Get a child to describe the appearance of trees, telegraph posts, etc., when viewed from a smoothly-moving railway train.	The trees, telegraph poles, etc., <i>seem</i> to be running away from the train, although we <i>know</i> that the train is running away from the trees and telegraph poles.	<b>The fact that the sun seems to move is no proof that it does really move. It is quite possible that the earth moves and that the sun stands still.</b>
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6. Tell children that we are certain that the sun is still and that the earth rotates on its axis once in every twenty-four hours.

A third and even a fourth lesson may be required to show that—

1. The axis of the Earth can be neither perpendicular nor horizontal.
2. In summer, in England, the axis of the Earth is inclined towards the Sun; in winter it is inclined away from the sun.
3. The Earth must move round the Sun as well as rotate on its axis: e.g., the last two facts might be thus taught:—

Observations and Experiments.	Results.	Inferences.
<p>4. (a) Place knitting-needle in a position slanting <i>away from</i> the lighted lamp; rotate ball; or,</p> <p>(b) Use the black cone without the lamp.</p> <p>(c) Refer to positions of England and New Zealand on the ball.</p>	<p>The points near the south pole are always in the light; those near the north pole are always in the darkness.</p> <p>The spot marked England is for a short time in the light and for a long time in the darkness, etc.</p>	<p><b>If the axis of the earth were always inclined away from the sun, the north pole would have perpetual night, England would always have short days and long nights, New Zealand would have long days and short nights, while the south pole would have perpetual day.</b></p> <p>In winter the axis of the earth is inclined away from the sun.</p> <p>Further infer that the earth must revolve or move round the sun as well as rotate on its axis.</p>

### B.B. SUMMARY.

**The earth rotates (turns) on its axis.  
The rotation of the earth causes day and night.**

### CLIMATE.

**1. Meaning.**—In dealing with climate the teacher should commence by giving the class a clear and accurate idea of what the term now embraces. For this purpose he should invite definitions or descriptions from the class, and seek to gather up all the correct items into one statement. He might assist by giving the derivation (*klima*) and its meaning. He might point out that the word really means a slope or inclination, and that the inclination referred to is the obliquity of the sun's rays. But the term embraces more than this, including as it does not only the temperature of a district, but its meteorological conditions generally.

**2. Latitude.**—(a) *The effect of the sun's rays is greatest where they fall perpendicularly on the surface of the earth, and diminishes as their obliquity increases.*



(b) The *surface* covered by the oblique rays is greater than that covered by the perpendicular rays.

(c) There is more *absorption* in the oblique rays, because the sun has to traverse more air particles, and as a result more is absorbed. Both these facts are clearly demonstrated in Fig. 1 of the lesson on climate which follows.

(d) The *slope* is important; to the south it is warmer than to the north. This is true of all latitudes.

These are the main points which the teacher will have to put before the class to give a clear conception of the influence of latitude on climate.

**3. Elevation.**—What is the influence of elevation? The teacher must point out that the higher we ascend the colder it becomes. Thus *altitude has the same effect as latitude*. But there are modifying circumstances, and the teacher must be careful to point them out. He must make the class understand that *the actual temperature of the air depends not so much upon the direct rays of the sun as upon the radiation from the heated surface of the earth*. He must be supplied with suitable illustrations showing that the mountains may keep off hot or cold winds; they may chill the winds with their snow caps; they may bring down the rain by condensing the moisture in the atmosphere; they may lie across, or in a line with the rain-bearing wind. These facts make the *rainfall* an important factor in climate. The addition of the snow chills, hence the *nature of the surface* is important; and, as they influence or intercept winds, the *prevailing winds* are of consequence; whilst it has already been shown that the direction of their *slopes* is a contributing element. Let us consider some of these influences in greater detail.

**4. The Nature of the Soil.**—The teacher will need to bring the following facts under the notice of his class:—

- (a) A sandy desert, a tract of luxuriant vegetation, an expanse of water radiate heat in very different degrees. The desert raises the temperature of the air much; the water little. These facts should be illustrated by a reference to the great heat of well-known deserts, and to their extremes of temperature sometimes. A reference to summer visits to the seaside, and a possible reference to land and sea breezes, would emphasise the more equable temperature of water as compared with land.
- (b) A newly ploughed field both absorbs and radiates heat much more rapidly than a grass field.
- (c) But good absorbers are good radiators. Hence the desert cools quickly; water does not. Why?
  1. Heat is diffused through a larger mass owing to the depth to which solar radiation penetrates.
  2. Owing to vertical and horizontal currents to great depths.

**5. Proximity to the Sea.**—We have *maritime climates* and *continental climates*, the temperature of the former being more equable. A few statistics might be quoted in proof of this; e.g., the climate of England might be compared with that of Canada or Russia, the comparison being restricted to parts lying in the same latitude. Again, *oceanic currents*, both hot and cold, are great influences, and the Gulf Stream and the North Polar current might be given in illustration. The amount of the *evaporation* is influenced by the proximity of the sea, and this leads us on naturally to the rainfall.

**6. Rainfall.**—The points here to be noticed are :—

- (a) Coast countries have more rain than inland countries.
- (b) Mountain regions are wetter than the plains.
- (c) The tropics have more rain than other zones.

Examples in illustration should be given in each case.

**7. Prevailing Winds.**—Atmospheric currents exercise a greater influence upon climate than oceanic currents. Illustrate by a reference to our own prevailing winds—our warm S.W. and our cold E. winds. Explain the cause in each case.

**8. Local Circumstances.**—All the influences enumerated may be more or less modified by local circumstances, but the teacher will not experience much difficulty with some of these, as they are almost self-explanatory. Such facts as the following are included :—

- (a) The amount of snowfall.
- (b) Bogs and marshes cool the air, and generate fogs.
- (c) Clay soils retain the moisture, and have the same effects as marshes.
- (d) The relative duration of summer and winter.
- (e) Some kinds of marshes abound in malarious and other exhalations unfavourable to health.
- (f) Large tracts of forests often produce the same results.
- (g) The clearing, drainage, and cultivation of land generally have favourable effects on climate. On the other hand, a too complete removal of forests may prevent the deposition of moisture to such an extent as to cause droughts (W. I. Isles) or even floods (valley of Po).

The teacher should be prepared to furnish examples in illustration of every one of these phenomena.

9. Finally the class might have the distinction between *weather* and *climate* pointed out. Weather is *daily*; climate embraces an average effect extending over many years.

In the teaching of climate too much must not be crowded into one lesson. The subject is far too wide for that. It will be sufficient if two or three headings are taken up and dealt with thoroughly in each lesson, as in the subjoined instance, which deals only with latitude.

## A LESSON ON CLIMATE AS INFLUENCED BY LATITUDE.

Information.	Teaching.
<p><b>Latitude.</b></p> <p>This determines the amount of heat received from the sun.</p> <p>1. Places nearer the equator are warmer than those more remote.</p>	<p>It is assumed that the class knows the meaning of the word climate as it is generally used.</p> <p>Facts 1, 2, 3, and 4 can be elicited by questioning. They could be explained by means of the following diagrams, which should be drawn upon the B.B. :—</p>

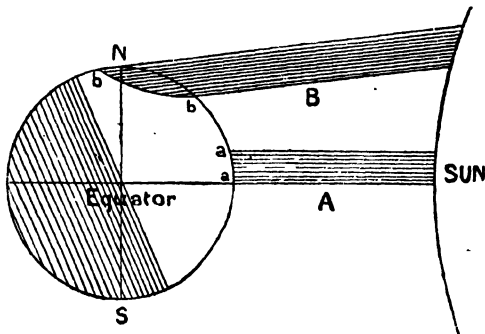


FIG. 1.

2. The day is warmer than the night.

3. Summer is warmer than winter.

4. Mid-day is warmer than morning or evening.

**A. Temperature.**

By this term is meant the different degrees of heat and cold.

(a) *Annual range.* This is calculated on the average of the varying temperature of the different seasons spread over several years.

(b) *Daily range.* By this is meant the difference between the temperature of day and night.

B. Places having the same latitude may have different climates, e.g. :—

Place.	Latitude.	Average Summer Temperature.	Average Winter Temperature.	Range
Edinboro	56°	57°	38°	19°
Moscow	56°	64	15	49°

Let A and B represent different bundles of equal rays; *bb* is longer than *aa*, hence an equal amount of heat is spread over a greater space. See Fig. 5 also.

Let the light portion represent day and the shaded portion night. The light

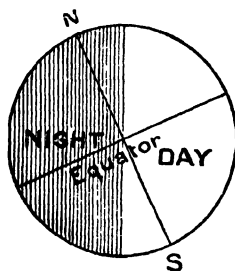


FIG. 2.

portion is turned towards the sun, the dark portion away from the sun. As the Earth turns round upon its axis once in every twenty-four hours, and as each half is alternately exposed to the sun for twelve hours (day), and turned away from the sun twelve hours (night), the difference in

LESSON ON CLIMATE AS INFLUENCED BY LATITUDE—*continued*.

Information.	Teaching.
<p>C. If the earth were entirely covered with water, or consisted entirely of land, then the climate of any part would be determined by its latitude, and therefore all places having the same latitude would have the same climate.</p>	<p>temperature between day and night will be obvious. Recall the fact that the sun is never so high in the sky during the winter as it is in the summer. Appeal to their experience, and ask if any of them have ever noticed this fact. Then sketch Fig. 3 in illustration. Fig. 4 will explain the reason of this, and should be carefully prepared by the teacher for this purpose.</p>

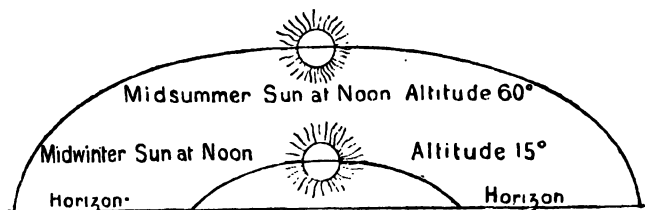


FIG. 3.

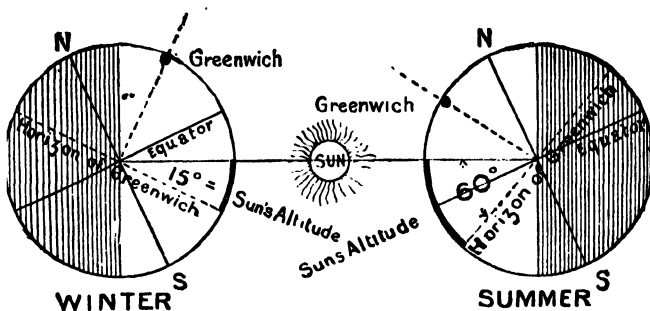


FIG. 4.

**D. Case of the Equator.**

The days and nights are equal all the year, hence—

1. The heat received by day, and that lost by radiation at night, are practically constant.

2. As a result there is no marked difference between summer and winter temperature.

3. Hence there is no range of temperature.

At sunrise and sunset the sun is near the horizon, and a pencil of rays (*aa*) is spread over a much greater space than an equal pencil (*bb*) at noon. At sunrise and sunset there is also greater thickness of atmosphere for the heat rays to pass through, and consequently more absorption of heat by the atmosphere.

A. Write A, *a*, *b* upon the B.B., and have them learnt by the class.

B. Then explain and illustrate them by a reference to table B. Write this table on the B.B. Have a map of Europe put up before the class, and let the places be

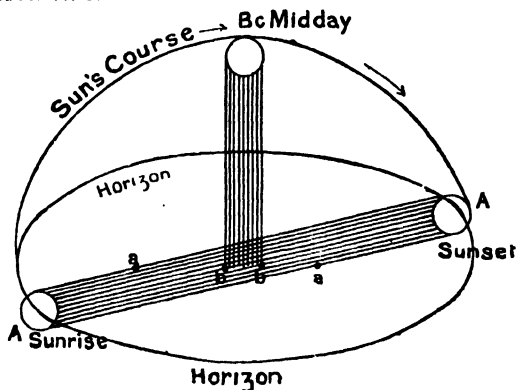
LESSON ON CLIMATE AS INFLUENCED BY LATITUDE—*continued.*

FIG. 5.

Information.	Teaching.
<b>E. 1. Insular Climate.</b> (a) The range is small. (b) The climate is temperate because water surfaces tend to equalise temperatures.	pointed out. The parallel of latitude should be traced from Edinburgh to Moscow to show that their latitudes are the same. C and D. Explain these. E. Elucidate E by a reference to B.
<b>2. Continental Climate.</b> A climate of extremes and great range of temperature.	

**NOTES OF A LESSON ON TRADE WINDS.**

In the teaching of winds three lessons stand out as of paramount importance—land and sea breezes, trade winds, and monsoons. As considerations of space prevent the giving of these three lessons in detail, one only, that on trade winds, is given as a type of the method to be adopted. The student should practise himself in writing similar notes on the other two.

Information.	Teaching.
<b>I. Introduction.</b> 1. Air, when unequally heated, forms currents, because heated air expands and ascends, being pushed up by the colder air.	I. This lesson should be one of a series. Lessons on winds generally, and one on land and sea breezes, should have preceded it. The teacher should briefly recapitulate the truths taught in those lessons. The class will discover, before the lesson finishes, some similarity between this lesson and the lesson on land and sea breezes,

## LESSON ON TRADE WINDS—continued

## Information.

2. Land and sea breezes are due to the varying temperature of the air.

## II. Origin.

1. The air at the equator, being the most heated, ascends, and begins to move towards the higher latitudes, and in the direction of the poles.

2. At about  $30^{\circ}$  (N. or S.) this current of air reaches the surface of the earth, and since it has left the air at the equator more rarefied, part of it, mingled with the air from the poles, returns to the equator, while part continues its course to the poles.

## III. Direction.

1. The equatorial current or upper trade wind.

- (a) S.W. in N. hemisphere.
- (b) N.W. in S. hemisphere.

2. The polar current or lower trade wind.

- (a) N.E. in N. hemisphere.
- (b) S.E. in S. hemisphere.

The trade winds are deflected to the *right* in the N. hemisphere, and to the *left* in the S. hemisphere.

## IV. Locality.

1. In N. hemisphere.

- (a) Belt of equatorial calms about 100 geographical miles broad.
- (b) Region of N.E. trade winds.

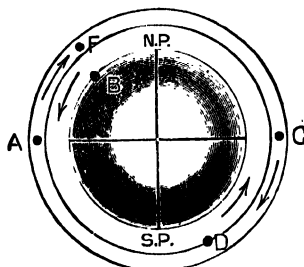
- (1) In Atlantic  $8^{\circ}$  to  $29^{\circ}$  N. lat.
- (2) In Pacific  $2^{\circ}$  to  $25^{\circ}$  N. lat.

## Teaching.

II. 1. *Illustrate* by a reference to the use of a fire in a room as a means of ventilation as well as warming. A further illustration might be found by a reference to the *origin of land and sea breezes*. To show that warm air expands and ascends do the *air-bag experiment*, and refer to the *ascent of balloons*.

2. Tell this, and illustrate as in III., 1 and 2.

III. 1 and 2. Point out on the map the latitudes referred to. Then *sketch* the following illustration on the B.B.



The air pressure at A is higher than at B, hence as air flows from the region of high pressure to that of low pressure, a current flows from A to B. This is the *equatorial current*, or *upper trade wind*, or *counter*, or *return trade wind*.

From diagram show there must be a greater weight of air over A than over F. Hence the movement from A to F.

But the barometer at B soon stands higher than barometer at equator, because of the flow of air in this upper current. Hence the movement from B to the equator. This is the *polar current* or *lower trade wind*.

If the earth were stationary these two currents would flow constantly due N. and S. But the trade winds are E. winds. Why?

- (1) The earth rotates from W. to E., and the rate of rotation is greatest at the equator, and grows less as we approach the poles.

- (2) The air has consequently its maximum rate of rotation from west to east at the equator.

When this air enters regions of higher latitudes it reaches districts which are rotating less rapidly than itself, and which therefore lag behind it; while the air, shooting forward, appears as a wind blowing from W. to E. In this way the upper

LESSON ON TRADE WINDS—*continued.*

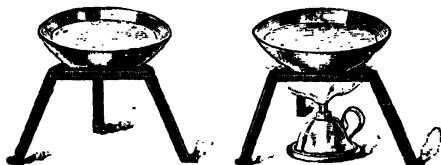
Information.	Teaching.
<p>2. In S. hemisphere.</p> <p>(a) Belt of calms.</p> <p>(b) Region of S.E. trade winds.</p> <p>(1) In Atlantic <math>3^{\circ}</math> N. to <math>28^{\circ}</math> S. lat.</p> <p>(2) In Pacific <math>2^{\circ}</math> to <math>21^{\circ}</math> S. lat.</p> <p>The belt of equatorial calms is frequently the scene of the severest tempests, with heavy rainfalls and thunderstorms.</p>	<p>current in the N. hemisphere becomes a S.W. wind, and in the S. hemisphere a N.W. wind.</p> <p>The converse is the case with the polar current. This enters a region of quicker rotation from a region of slower rotation, and lags behind. It does not rotate so quickly as those parts of the earth near the equator, and is therefore perceived as an E. wind—N.E. or E. in the N. hemisphere, S.E. in the S. hemisphere.</p> <p>IV. 1a and 2a. The S.E. and N.E. trade winds meet near the equator.</p> <p><b>Anticipated result.</b>—They ought to unite and form a gentle wind blowing to the W.</p> <p><b>Actual result.</b>—Both are suspended through the strong upward draught produced by the rapid and extensive rarefaction at the equator. This produces the <i>belt of equatorial calms</i> about 400 geographical miles broad.</p> <p>1b and 2b. Point these out on the map. Refer to storms of the belt of calms.</p> <p>A map should be sketched on the B.B. showing the directions of the trade winds, and the position of the belt of calms.</p>

**A LESSON ON RAIN.****I. Principles Demonstrated and Explained.**

These should be taught by *observation* and *experiment*.

**1. Evaporation.**

- (a) Take two tin saucers of equal size with equal quantities of water. Apply heat to one and not to the other, or place one near the fire and the



other in a cool place. *The one supplied with most heat will lose its water first, which will evaporate.*

- (b) Refer to school ink wells. The ink in them dries up; i.e., *the ink evaporates.*
- (c) *Cold dry winds* in the spring often bring chapped hands. The moisture of the hands is evaporated by the wind. The natives of Africa, in order to protect themselves from the too rapid perspiration occasioned by the *simoom*, cover themselves with fatty substances.
- (d) The *drying of the clothes* after washing can also be referred to.

**2. Condensation.**

- (a) Hold a *slate in the steam* issuing from a kettle spout. The slate becomes moist. *The vapour has been turned into water again—it has been condensed.*

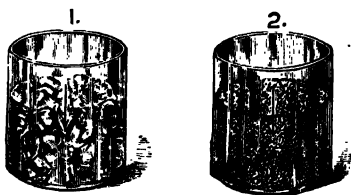


- (b) Refer to a *crowded room and the moisture on the windows*. The moisture from the bodies given off in the form of vapour has been *condensed* by the cold glass.
- (c) Refer to a *cold day*. You can see people's "breath"; *i.e.*, the moisture contained in the breath is condensed as soon as it appears from the mouth or nostrils.

**3. Application of these Truths.**—These truths should then be applied to explain the **formation of rain**. The class should be able to tell the teacher that **rain is formed by the evaporation and subsequent condensation of the water of the earth.**

**4. Why Does Rain Fall?**—The class will understand the influence of the sun and the formation of clouds from what has already been demonstrated. But why does rain fall?

Take two large glass jars and nearly fill them with water. Drop lumps of chalk in one and powdered chalk in the other. The heavy particles in (1) fall; *i.e.*, they sink quickly. The light particles in (2) float.

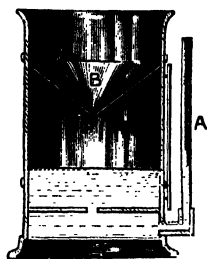
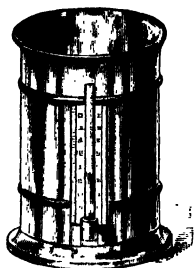


Apply this fact to the particles of moisture in the air. **The condensed and heavier particles fall as rain.** The lighter particles remain floating in the air as vapour or clouds. Then when a cold wind or cold mountain top or slope further condenses the moisture in the air, it becomes too heavy to remain in suspension, and so falls as rain.

**II. The Rain Gauge.**—Show one if possible, and explain its action. If not, explain from a sketch on the B.B. "M is a cylindrical vessel, closed at the top by a funnel-shaped lid, in which there is a very small hole, through which the rain falls. At the bottom of the vessel is a glass tube (N), in which the water rises to the same height as inside the rain gauge, and is measured by a scale on the side as shown in the figure."



"The apparatus being placed in an exposed situation, if at the end of a month the height of the water in the tube is two inches, it shows that the water has attained this height in the vessel, and consequently that a layer of two



inches in depth expresses the quantity of rain which this extent of surface has received."—Ganot's *Physics*.

**III. Rainfall.** This is measured by the rain gauge. The amount for each day is registered, and the average taken for the year. This gives the *annual rainfall*. The *average rainfall* can be taken from the average of a number of years. A day is rainy when the rainfall is not less than .01 inch.

To give some idea of the amount of rain that falls put the following statistics on the B.B.

1 inch of rain on a square yard gives 4'679 gallons, or 47'74 lbs.

1 inch of rain on an acre gives 22,662 gallons, or 101 tons.

### **FURTHER SUGGESTIONS ON THE TEACHING OF GEOGRAPHY.**

As it is impossible within the limits of such a chapter as this to set out the methods for the teaching of the many subjects embraced under the term geography, a few further suggestions are made with a view to rendering assistance in the planning out of a few typical lessons. The skeleton of the lesson is provided; the teacher's task will be to fill in the details, to think out his own experiments and illustrations, and to make any modifications in the general outline that special or local circumstances may require.

**Lessons on Towns.**—Only the most important or the most interesting should be dealt with. One of the worst errors of geography lessons and geography books is the overcrowding of names, and the names of towns generally figure largely in this overcrowding. Having chosen the subject of the lesson, the teacher should proceed to deal with it as follows:—

#### **1. Locality.**

- (a) Latitude.
- (b) Altitude.
- (c) Position—coast or inland; river (if any).

**2. Climate.**

- (a) Maximum and minimum temperature.
- (b) Range of temperature.
  - 1. Daily range.
  - 2. Annual range.
- (c) Prevailing winds.
- (d) Rainfall.

**3. Occupations.**

- (a) Industries.
- (b) Commerce.
- (c) Agriculture (crops).
- (d) Minerals.

**4. Population.**

- (a) Present population.
  - (b) At last census.
  - (c) Health ; death rate ; reasons for high or low rate.
  - (d) Religion.
  - (e) Social life ; houses ; dress ; amusements.
- } Rate of increase or decrease.

**5. Communications.**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>(a) <b>Land.</b> <ul style="list-style-type: none"> <li>1. Rail.</li> <li>2. Trams, etc.</li> <li>3. Roads.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>(b) <b>Water.</b> <ul style="list-style-type: none"> <li>1. Rivers.</li> <li>2. Canals.</li> <li>3. Trade routes.</li> </ul> </li> </ul> |
|---|---|

**6. Government.**—Whether a corporation or vestry, etc. The amount of local control (if any) possessed ; the methods of election, etc.

**Lessons on Railways.**—Show a map of the country chosen for the subject of the lesson, with its railway system well marked. The maps of the railway systems of one or two other countries should be put up also for the purpose of illustration, comparison, or contrast, and the systems should be carefully chosen with a view to this purpose.

1. Total mileage. Compare with other countries.
2. Number of trains, and rate of travelling. Compare district with district and country with country again. Get or give reasons for different rates.
3. Fares : workmen's, Parliamentary (explain). Express, etc.
4. Trade uses of railways. Preferential rates : their influence on trade. Light railways. Post-office work (Royal mail).
5. Pleasure uses of railways. "Trips" or excursions. Mountain railways (Switzerland).
6. Method of accommodation : closed or open compartments ; corridor trains ; Pullman cars ; buffets ; sleeping carriages. Compare English, American, and Continental.
7. The ticket system. Compare English with Continental. Electric railway system (no tickets).

**Lessons on Articles of Commerce.**—Take *coal* as an example.

1. Distribution (coal fields to be marked on the map).
2. The extent of the coal industry. Compare with other countries.
3. Its uses.

- (a) Manufactures.
- (b) Locomotion.
- (c) Sea travelling.
- (d) Domestic uses.

4. Its substitutes : peat, wood, charcoal.
5. Exported to or imported from. Places to be named and pointed out.
6. Its influence on the trade and wealth of the country.
7. The factors determining its price.

**Lessons on Geographical Apparatus.**—One of the chief characteristics of the present teaching of geography is the development of improved apparatus for realistic teaching. Globes, maps, and diagrams of all sorts are produced in abundance and in better quality than before ; but the greatest development has been in the production of instruments and models for the teaching of the physical branch of the subject ; and although the present price of many of these articles keeps them out of many schools, still the young teacher ought to keep himself posted in the latest improvements of this kind. These pieces of apparatus are full of suggestions, and they may help to elucidate problems that have hitherto been unintelligible or obscure to the teacher, and they may further give him hints for the construction of cheap, simple and self-made apparatus. Illustrated descriptions of these and of other pieces of apparatus should be collected—they are easily obtainable from the illustrated advertisements constantly appearing, and from the readily issued illustrated catalogues of the publishers—and pasted in some note book kept for the purpose. Such a book would be neither the least valuable nor the least useful in the student's library. Such pieces of apparatus would include the Geodoscope, the Tellurian, the Orrery, Cunningham's apparatus for illustrating the causes of the seasons, the Selenotrope, the Terrestrial Time Globe, the Volvorb, Clayden's model of the Atlantic, Jessop's apparatus for illustrating the effects of the earth's revolution in her orbit, and the Planisphere. The Globe is here chosen, because it is within the knowledge and experience of all.

## The Globe.

### 1. Its Principal Uses.

(a) To show the shape of the earth; its motions; its inclination; its zones; meridians; latitude; longitude; equator: ecliptic, etc.

(b) To teach climate, the angle of the sun, and the proximity of masses of land and water.

(c) The relative position of the various continents, countries, oceans, seas, etc.

(d) To teach tides, day and night, seasons, sunrise, and sunset.

(e) A globular magnet should be used for lessons on attraction and gravitation.

(f) A relief globe should be used for teaching mountains, valleys, etc.

**2. Preparatory Lessons.**—To enable a child to thoroughly understand the teaching of the globe, previous lessons should have been given on the curvature of the earth, on attraction, and on the inequalities of the earth's surface.

(a) **Simple Lessons on Attraction.**—These lessons will help the children to understand how things adhere to the earth.

(1) *Cohesion* can be taught by dipping a pencil in water.

(2) *Magnetic attraction* can be shown by a few experiments. The children will thus learn that bodies have the power of attracting or drawing each other.

(3) Extend these notions to explain *gravity*, as affecting larger bodies like the planets and stars. A globular magnet would be a great aid; failing this use an ordinary magnet.

(b) **On the Curvature of the Earth.**—The curvature of the ocean will be illustrated by a reference to the manner of appearing and disappearing of ships. This can be illustrated by a small toy ship and a very large globe. Do not attempt other proofs at present.

(c) **Lessons on the Inequalities of the Earth's Surface** should be given. This would give the idea of mountains, hills and valleys.

### The Comparative Method.

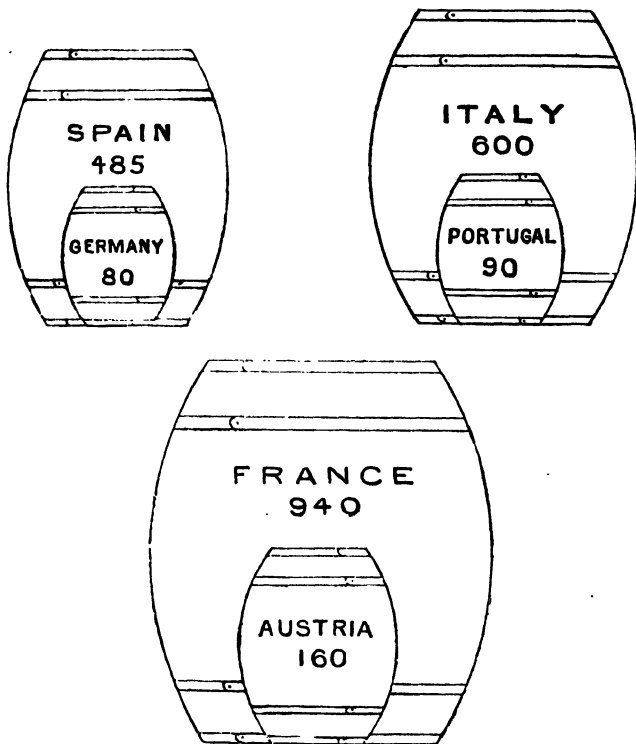
This is the method of teaching on which several of our school geographies are more or less based, and it may be used to advantage in some cases; but the resemblances should be real, and similarity should always precede dissimilarity, **for points of likeness are more important than points of difference.** The placing of the facts side by side fixes the attention by appealing to **curiosity** and the **critical faculty.** When the comparisons take a graphic form the value of the method is enhanced. **Contrast**, a most valuable aid to memory, is the converse of **comparison**, and is very freely used. Illustrations follow, the first being taken from Meiklejohn's *Geography*, and the second from Gill's *Student's Geography*.

**1. Mountain Lakes.**

- (a) Very deep.
- (b) Have high and steep shores.
- (c) Are generally long and narrow.
- (d) Irregular in shape.
- (e) Picturesque scenery.

**Lakes in Plains.**

- (a) Generally shallow.
- (b) Have low sloping shores.
- (c) Are often broad.
- (d) Regular and monotonous in shape.
- (e) Tame scenery.

**2. Wine productions in millions of gallons.****EXAMINATION QUESTIONS.**

1. What is the meaning of the distinction between physical, political, mathematical, and industrial geography? Say which of these should be first taught, and why.

2.—Describe fully the relative advantages of questioning children in geography: (a) Out of sight of any map; and (b) With a map before them on which there are no name of places; and state the best way of combining these two methods of examination.

3.—Draw a map of the school premises, and of the roads or streets adjacent, with which you are most familiar; and say what use you would make of such a map in teaching the elements of geography.

4.—Notes of a lesson on a cape; mountains; river Mississippi; climate; winds; snow and rain (I.); changes of the season; islands; rain; formation and course of rivers; rivers.

5.—Draw a plan of the schoolroom, and show how it may be applied in the teaching of scale and proportion in map-drawing to scholars in the First Standard.

6.—Name in progressive order of teaching, the apparatus required for lessons in geography, and show how you would give a conception of scale and proportion in map-drawing to young children.

7.—State the chief points to be noticed in giving a lesson on "A River," with the order in which each point should be introduced to the class. Illustrate your answer by some English or Scotch river.

8.—Show that a map differs from a picture, and explain how you would supply the deficiencies to a class beginning to learn geography.

9.—Point out some of the means by which the attention of a class may be sustained through an oral lesson of thirty minutes' duration on geography, so that the dull or backward children may not be allowed to suffer.

10.—Name the principal uses of a globe in teaching geography, and state fully how you would employ it in giving a lesson on day and night.

11.—By what illustrations would you give children their first ideas of mountains and rivers; (a) from their own experience; and (b) on the blackboard?

12.—A complaint is frequently made that geography, as taught in schools, is confined to lists of capes, heights of mountains, etc. How far are such lists useful, and for what purpose? Illustrate from your knowledge of British capes and mountains.

13.—How would you begin teaching geography to a class of young children? Give the substance of a few of your first lessons.

14.—Draw a plan of the schoolroom with which you are most familiar, showing the position and relative sizes of desks and gallery. Explain the advantages or disadvantages of the arrangement.

15.—Describe the sort of apparatus and visible illustration which is likely to prove most helpful to a teacher in giving the earliest lessons in geography.

16.—After explaining to a class the effect of mountain ranges on climate, show how you might lead the children to seek further proofs for themselves.

17.—In giving a lesson on a river, which is the better plan—to speak first of a particular river which the children have seen, or to start with a definition and a general description? Give reasons for your opinion.

## CHAPTER XIII.

## HISTORY.

**Value of History.**

1. It helps to reveal the past history of the country, and so gives an amount of valuable *information*.

2. It calls forth feelings of *patriotism*. It stimulates the *national pride*, promotes a love of virtue, gives powerful object lessons against *vice*, and tends, rightly taught, to make *good citizens*. This ought to be its prime aim.

3. It arouses *interest* and *curiosity*, and so helps to form habits of *concentration*. This object is defeated when history lessons are crammed.

4. It furnishes plenty of work for the *reasoning* powers. The pupil learns to trace cause and effect; to generalise; and to make valuable inductions. He finds a cycle in historic events—that history repeats itself. He sees the power of the monarch grow less, and he learns why; how one class rises and another falls; and facts which throw a powerful light upon present tendencies, and give plenty of scope for thought.

5. Properly taught, and methodically studied, it may be made a good training for the *memory*, which it taxes severely.

6. Persons and events of the past are still on their trial before posterity. History presents evidence which is weighed and reasoned on; conclusions are arrived at, and *judgment* is pronounced. It thus cultivates the *critical faculty*.

7. Our *sympathies* are often called into active play, and anything which strengthens and develops sympathy is a valuable aid to social progress. It also provides a legitimate safety-valve for the play of the *malevolent affections*.

8. It increases our capacity and opportunities for *pleasure*. By association the objects in our museums, our old buildings, our

battlefields, all possess an added interest and attraction from our knowledge of history.

9. It helps to brush away national *prejudice* by giving us some knowledge of other nations. Bias against, and hatred and contempt for other nations, are often the result of ignorance.

### **The Objects of History.**

"The history of mankind is the history of great men. To find out these, to clear the dirt from them, and to place them on their proper pedestals, is the function of the historian. He cannot have a nobler one." (Carlyle.) This is equally true of the teacher's function.

"The object of history is to discover and make visible illustrious characters, and pay them ungrudging honour. History teaches that right and wrong are real distinctions. That is the best condition of things which produces, not the largest amount of knowledge or wealth, but the men of noblest nature. Does history show that in proportion as men are left to their own wills they become happier, truer, braver, simpler, more reverent of good, more afraid of evil? This is a high ideal, but it is one the historian should strive to reach, for the only true progress is moral progress." (Froude.)

What is true of the historian is again true of the teacher. The progress of morality and the development of patriotism should always be the two chief objects sought in teaching.

Bacon says it is the true object of history to represent the events themselves together with the counsels, and to leave the observations and conclusions thereupon to the liberty and faculty of every man's judgment. A Greek writer says history is philosophy teaching by example.

"Now, what is the problem of teaching history? It is (i.) to introduce several hundreds or thousands of persons, and several hundreds of events, to an age that knows nothing, except by the power of sympathetic or anticipative imagination, of men or of things; (ii.) to make each person introduced an individual and a real character; (iii.) to show the connection of cause and effect between great events." (Meiklejohn.)

### **General Hints on the Teaching of History.**

1. The teacher should combine history and geography, so as to teach certain valuable lessons concerning territorial, political, and commercial history.



2. He should seek to bestow accuracy and skill in representing graphically the ideas gained from books.

3. He should teach the association of different subjects, and the knowledge that they are diverse parts of one whole.

4. He should show the connection between history and literature.

5. The pupil should receive very definite general impressions of the progress of historical events. He should also learn a considerable number of historical facts, not necessarily for immediate use, but to serve as a point of resistance for gaining other such facts in future years.

6. The pupil should make some progress in learning how to use the material he has acquired.

7. "He should develop keenness of observation in regard to the political and social conditions in which he finds himself. These conditions of themselves are seldom of interest to the pupil, for it is physical rather than mental activity that appeals to him. But our Great Charter, such rebellions as those of Tyler and Cade, our poor law, etc., should lead to a knowledge of what the State does for its dependent classes. The study of the colonists' resistance to taxation that fires the boy's heart should lead to an interest in the principles of taxation in his own day and country. Every concrete illustration of the past should find its parallel or its abstract application in the present." (Miss Salmon.)

#### **Difficulties in the Teaching of History.**

1. The subject is by no means an easy one, for *it demands plenty of good sound reasoning and reading* from the teacher. In the Baconian sense, the teacher must be essentially a "full" man.

2. *The maintenance of a proper historical perspective* is difficult. Events and persons want keeping in their proper places. The leading characters and their chief works need to be in the front of the picture plane. The unimportant, both in person and fact, should be omitted or put well back in the picture.

3. The teacher requires *good descriptive powers* to vitalise his characters and events. This will involve the possession of good vocal control, more or less dramatic ability, a readiness of illustration, and a skilful use of the forces of contrast and comparison. The imagination and the emotions also require skilful management.

4. There is a tendency to *abuse the memory* rather than to use

it. It is so easy for the teacher to give a chapter to be read up, and then to examine upon it. The memory is overworked, and very often matter thus acquired is neither digested nor retained. The memory is called into play extravagantly. If a chapter is to be read it should be read *after* a lesson on its subject matter had been given, and not before.

5. There is a further tendency to *overwork*. Too much is often demanded for the time at its disposal, and the result is disastrous. The work is neither properly taught nor digested. Even where the demands are apparently more reasonable, and a "period" only is prescribed, we have that commendable craze for "thoroughness" showing itself in the examination questions, and which must of necessity involve more work.

6. It requires, for effective teaching, a *great mental range* on the part of the pupils. History is a strange mixture of the very simple and the very difficult. Parts fall easily within the comprehension of young scholars; parts require much ripper minds. Hence *the lessons must be suitable*; and the principle of selection involved is often very trying for the teacher.

### **Faults in the Teaching of History.**

In stating the difficulties of teaching history, one naturally indicates some of its faults, for the two facts stand in the relation of cause and effect.

1. *Too much is attempted*; a mass of detail is crowded into book and lesson, only to the damage of both. This kills all interest.

2. The memory is unduly taxed; training and education disappear, and *cram* becomes rampant. This kills good method.

3. *The teaching is often unconsciously obscure*. Allusions are made, and it is often assumed they are understood. Terms are given without being defined or explained. They may be understood by the teacher: they rarely are by the class.

4. All history lessons ought to be focussed on its two main objects—moral and patriotic. This is more frequently forgotten than remembered. *The focus being wrong, the view cannot be right*.

5. *Unsuitable matter* is chosen. Often, if it is suitable in quantity, it is unsuitable in kind or quality.

6. Often there is *insufficient preparation*. Preparation is absolutely essential, even if the teacher be a full reader and a

deep thinker. The obscurity attaching to many of the lessons is one of the results accruing from this too prevalent fault.

**History Books.**—Professor Meiklejohn once asked in a lecture delivered by him on the teaching of history: What are the qualities we desire to find in a history book? What would a common-sense person desire to find in a history that was to be used in schools, and that would be good for the growing mind? He suggested three things:—

1. That the history should be interesting in itself; that it should attract and not repel its readers; that it should be read for its own intrinsic interest, and not merely for duty.

2. That the history lent itself to good reading aloud; *i.e.*, it should be written in a spirited, vigorous, and human style.

3. That it lent itself easily to reproduction; *i.e.*, that the facts and events stated and described in it were so plainly and clearly stated and described, that the young learner could easily state them over again in his own way.

### STAGES IN TEACHING HISTORY.

**I. Stories.**—Begin with stories. Children love these, and if they are pleasantly rendered, there is soon a decided liking for them throughout the whole class. Do not seek to give too much information at first, but rather try to *interest* and *amuse*. Let there be some human nature in your lessons, and let them deal with the ways, actions, and motives of men in an elementary fashion.

**1. Attractive Stories.**—The stories, then, must be attractive, and every teacher of history who has had an experience of a young class in the subject knows that there are certain stories or episodes which prove particularly attractive to the scholars. Such stories include—

- (a) **Biographies.**—Under this head will fall stories of Caractacus, Boadicea, Alfred, Becket, Rosamond, Wallace, the Black Prince, the young Princes of York, Wolsey, Lady Jane Grey, Mary Queen of Scots, the Seven Bishops, Raleigh, Drake, the Pilgrim Fathers, Cromwell, Marlborough, Wellington, Nelson, the young Pretender, Robin Hood, Hereward, Prince Arthur, etc.
- (b) **Rebellions, etc.**—These will include such things as Wat Tyler's insurrection, Jack Cade's rebellion, the rebellion of the Percies, the Gunpowder Plot, the Meal Tub Plot, Monmouth's rebellion, the rebellions of the Pretenders and the Chartists.
- (c) **Battles.**—These should embrace such events as the piratical raids of the Danes, the Battle of Hastings, the Crusade, Bannockburn, Crecy, Poitiers, Agincourt, the Spanish Armada, Blenheim, Trafalgar, Waterloo, Balaclava, the Indian Mutiny, and the Zulu War.

- (d) **Miscellaneous.**—In this group could be placed such incidents as the meeting at Runnymede, the formation of the New Forest, the drowning of Prince William, the Field of the Cloth of Gold, the Great Plague of London, with its closely following Fire, the French Revolution, the First Exhibition, and so on.

**2. The Reasons for their Attractiveness.**—They are attractive because of their emotional character. There is a solid tinge of sensationalism or romance in many of them; and romance was ever attractive to the young. The imagination is indulged, and this indulgence introduces another element of pleasure. Pleasure is one of the most powerful of human motives. Whilst listening to these stories, there is a perfect indrinking of emotion, and our best psychological authorities consider this as essential for children as country walks, games, and treats. There is much of that which attracts in fiction and in the drama. These stories produce a certain amount of mental excitement, which is stimulating and enjoyable. The strength of this element can be easily understood when we reflect that the so-called pleasures of older people are often based on excitement. These historic actions appeal to our egoistic and social feelings, and so minister to our happiness. Admiration for courage, virtue, success; anger, contempt, scorn; pride of race, of conquest, patriotism in its strongest aspects, all these feelings are affected in turn, and contribute their share of attractiveness. The feeling of rivalry is stimulated only to be regulated and guided. The love of activity and power finds mental outlets in these stories. We fight with our heroes—on their side; we share their risks and triumphs, their love of approbation, and learn to love and respect them. We sympathise with those who suffer unjustly, and our sympathy runs warm into kindred cases in our own small circle. There is little or nothing educative in the first instance, for the pleasures of knowledge are yet too weak to avail; but the foundation of a love for the subject is being laid in an attractive manner, a foundation upon which is to be built the after structure of a sound historical training.

**II. Biographies.**—The teacher will then pass on to biography in a fuller and more educative manner, and this stage would be suited to Standard IV. and upwards. Further remarks upon this branch will be found under the head of the "Biographical Method" in the section on "Lessons on Reigns"; and still later under the head of "Notes of Lessons on Biographies".

**III. Incidents.**—This will be an expansion of the "Mis-

cellaneous" item under the head of "Stories". As in the preceding case, the subjects will be handled more fully, losing none of their attractiveness, it is hoped, but requiring more thought, and furnishing more training and education. The incidents should be striking, instructive, and interesting. They would include such subjects as travels, battles, voyages, plagues, rebellions, famous Acts of Parliament, plots, etc.

**IV. Periods.**—A period of history should next be taken—say the Tudor or Stuart period. But even here the teaching will be largely biographical. The period may be taught by one of the methods laid down in the "Lessons on Reigns".

**V. Constitutional History.**—A "period" could be taken in each of the higher standards, but in the highest standards the elementary principles of our Constitution should be explained; the constitution and functions of Parliament; the social and religious state of the nation, and so on. In every stage biography will form a part of the teaching, for the lives of eminent men are the historic pegs around which hang the events of a period.

### LESSONS ON REIGNS.

**I. Their Use.**—Any such lessons as these should be given at a late period in the school course. If history has been well taught in a school, it will not have been through the "reigns" as a syllabus of lessons primarily. But as a means for *summarising* or for *recapitulating*, the reign can be used with some profit. It will test the pupil's memory and synthetical power to retain and pick out and group those portions of a series of lessons on the biographies, Constitution, literature, etc., of the people which belong to any particular reign. Few will be able to do this, as the test is too severe. Hence such lessons will afford an opportunity to the teacher of presenting his facts—facts which for the most part should be already known, or at least familiar—in a *new combination* to the pupil. The name of the sovereign will serve as a useful centre, around which these events might be grouped.

**II. Method of Teaching.**—There are many methods laid down in the various text books in use, but perhaps the first given is the best.

✓ **1. The Chronological Method.**—The reign should be presented as a complete picture, the parts bearing each its due weight. The lesson then really reverts to a species of biography, in which the sovereign may or may not play a conspicuous part.

But all that has been said in favour of teaching history through biography can be repeated here, for it bears as much value.

Most authorities consider this the right method, and therefore the best method. The study of history, it is asserted, should be progressive, so that the most picturesque and elementary portions can be taken first. This method starts with simple conditions of life and society, and so appeals to curiosity. It does not at first require much initial knowledge, and it makes less demand on that higher intelligence which is necessary for a proper understanding of much of the later history. It proceeds from the simple to the complex, and is a synthetic method.

**2. The Parliamentary Method.**—In this case the reign is taught through the medium of its Parliaments. The lessons can be made methodical, clear, and intelligent. Only the most important work of each Parliament should be given, as it is unwise to overload the mind with detail. The method has one great recommendation—it teaches the history of the people, which is history proper. But it is wearisome, scrappy, and often dry. It is very difficult to maintain interest by it, and the objection is a serious one. Of course, a very capable teacher can turn any legitimate method to profit, for he is the master of his method, and not the slave of it. But the remarks are true for the average teacher. Again, it does not lend itself to the early reigns of history, so that its application is limited. The reign of *Charles I.* is taken as an illustration.

(a) **First Parliament.**—Met 1625. Voted two subsidies of about £140,000 for war expenses. Sat two months only. Why?

(b) **Second Parliament.**—Met 1625. Why called?

(1) They voted inadequate supplies.

(2) With these grants they coupled the condition that *they were to control and regulate every part of the government which displeased them.*

(3) *They withdrew the king's prohibition, and let Bristol take his seat in the House of Lords.*

(4) *They voted that common fame was sufficient ground of accusation by the Commons.*

The other Parliaments could be similarly dealt with. Obviously, one reign may require many lessons, each of which will make some demand upon a knowledge of the Constitution and functions of each branch of Parliament. For this reason alone such a method could only be used in the highest classes of the school.

**3. The Classification Method.**—Here we have the events of a reign classified under such well-known heads as—

(a) Foreign policy.

(b) Home policy.

(c) Science, art, literature.

Or the history of the reigns may be classified under such heads as—

(a) The growth of constitutional liberty.

(b) The power of the Church.

(c) The growth of towns.

(d) The growth of trade, manufactures, etc.

(e) The growth of the navy.

(f) The progress of colonisation.

(g) The growth of education.

This method is logical, clear, intelligent, interesting, and lends itself to the memory. It disputes the palm with the first method, and by many is preferred to it.

**4. The Biographical Method.**—There is much to recommend this method. The events of a reign are the work of the great minds of that reign; and the lives of a few eminent men will embrace and explain the cause, conduct, and results of those events. Such men exercise a greater influence on a nation than a monarch. Any striking or suggestive anecdotes will be very useful to illustrate and to add interest to the lesson. Another great recommendation is its unity of plan, and the individual becomes a nucleus for occasional instruction on many other subjects.

✓ **5. The Comparative Method.**—Two periods are taken, and one is compared with the other. A present reign is compared with a past; the reigns of two queens might be compared; the War of the Roses with the Civil Wars. The method is adapted to all branches of the subject. Two movements or classes might be compared: two individuals, two rebellions, or two great charters. The Lollards might be compared with the Puritans; Cade's rebellion with Tyler's; Walpole with Gladstone; or Pitt with Beaconsfield. The general principle of this method must be remembered—that *points of likeness are more important than points of difference*. Contrast may be considered a negative aspect of the same method. In such cases Walpole would be taken with Pitt, and so on.

✓ **6. The Regressive Method.**—This method begins with the present and works back, step by step, to the earliest times. Its opponents assert that the present is more or less commonplace and less attractive, and that it is a method of teaching history backwards. It is further charged against it that it demands "a familiar acquaintance with the political and social conditions of modern times, and an ability to recognise and understand the causes which have brought about the present complex conditions

of society". The method is therefore said to be unsuited to the capacity of young children, although its suitability is admitted for more advanced pupils. It proceeds from the known to the unknown, and is an analytic method.

The degree of truth attaching to these objections depends upon the nature of the initial lessons. Where available, these should proceed through Object Lessons, such as Our English Coins, the Market Cross, the Village Church, the neighbouring Castle, etc. The strong point of such lessons is that they develop observation and interest in existing things. But if the first lessons should be on such complex notions as a State, a Nation, a Dynasty, a Parliament, Legislation, Justice, etc., the method is not to be commended.

**7. The Concentric Method.**—By this method a series of lessons is taken, completed, repeated in greater detail, and yet again in still greater detail. The circle of knowledge expands with each repetition. It is an old method and a good one, proceeding from the simple to the complex, and after the first round or completion, from the known to the unknown. It allows the work to be carefully graded; but, carelessly handled, it may destroy interest. "Hashes" are not popular even if strengthened with scraps of fresh meat.

An illustrative plan of lessons now follows on Walpole. History lessons are often colourless and abstract, but in biography the personality of the hero is ever before them. The children put forth an effort of constructive imagination, form their hero, and follow him eagerly through the chief incidents of his life. The interest of pursuit is thus called into play; and the lessons become vivified.

#### LESSON ON WALPOLE.

Information.	Education.
<b>I. Early Life.</b>	<b>I. Treat this portion of the lesson briefly, but call attention to—</b>
1. Born, 1676.	1. <i>His success.</i> He attains the highest office in the State. Why? <b>Inference.</b> <i>Because of his ability and energy.</i>
2. Entered Parliament for Castle Rising, 1700.	2. <i>His failures.</i>
3. Councillor to George of Denmark.	(a) Guilty of breach of trust.
4. Secretary at War.	(b) Guilty of notorious corruption.
5. Chief hand in Sacheverell's impeachment.	3. <i>His punishment.</i> He was to be—
6. Paymaster of the Forces.	(a) Committed to the Tower.
7. Disunion in Cabinet. He retires.	(b) Expelled the House.
8. Resumes former office.	<b>Application.</b> <i>High trust demands high principle; great power demands great honesty.</i>
9. Prime Minister, 1721.	



## LESSON ON WALPOLE—continued.

Information.	Education.
<p><b>II. Prime Minister.</b></p> <p><b>1. Personal Characteristics.</b></p> <p>(a) Neither a scholar nor a cultivated man; knew next to nothing of history.</p> <p>(b) Good-natured man; frank; of great industry. A great sportsman.</p> <p>(c) Great tact and common sense; a good business man.</p> <p>(d) No orator, but a good debater. Too fond of power; overbearing manner.</p> <p><b>2. His Statesmanship.</b></p> <p>(a) <b>His Love of Peace.</b></p> <p>Unsuccessfully resisted the Spanish war.</p> <p>(1) "They are ringing their bells now; they will soon be wringing their hands."</p> <p>(2) "Madam, there are 50,000 men slain in Europe this year, and not one Englishman." 1734.</p> <p>(3) "My politics are to keep free from all engagements as long as we can."</p> <p>(b) <b>His Bribery.</b></p> <p>(1) Refer to venality of Commons. M.P.'s sold their votes. Electors were bought and sold.</p> <p>(2) No publicity on the votes given in Parliament.</p> <p>(3) Newspapers not allowed to publish members' speeches.</p> <p>(4) "Every man has his price."</p> <p>(5) The charge of bribery overstated. Only one case proved.</p> <p><b>3. His Financial Policy.</b></p> <p>(a) <b>His Excise Bill.</b></p> <p><i>Its object to stop smuggling.</i></p> <p>(i.) By establishing bonded warehouses.</p> <p>(ii.) By raising the revenue from inland dealers in the form of <i>excise</i>, instead of levying at the ports in the form of customs. Thrown out 1733.</p> <p>(b) <b>His Free Trade Policy.</b></p> <p><i>The necessities of life and the raw materials of manufacture were to be free of all imposts, and that indirect taxation might be the means of freeing land from most of its burdens, if not from all of them.</i></p> <p>His opponents held that revenue should be drawn wholly from direct taxes on land.</p>	<p><b>Contrast or Compare him with other great men.</b></p> <p>These comparisons, etc., are naturally limited by what the teacher has done in previous lessons on biography.</p> <p><b>II. 1. (a)</b> These show his <i>mental</i> qualities.</p> <p>(b) These facts reveal his <i>personal</i> qualities.</p> <p>(c) These his <i>parliamentary</i> qualities.</p> <p>Briefly show the influence of these characteristics upon him as Prime Minister</p> <p><b>2. Describe his peace policy and show—</b></p> <p>(a) <i>Its success.</i> The country daily grew more wealthy; taxes were light; trade was flourishing. Quote his proud boast expressed in II. 2. (a) (2). Point out that he understood the truest interests of his country better than any of his contemporaries.</p> <p>(b) <i>His foresight.</i> The Spanish war ended disastrously. <i>He maintained that a nation never gained anything by war.</i> Point out that his opinion expressed in II. 2. (a) (1) became true, and justified his policy as expressed in II. 2. (a) (3).</p> <p>(c) <i>His obstinacy.</i> He took no interest in foreign policy. Show that this was one of the chief factors in his downfall.</p> <p><b>Compare with Mr. Gladstone.</b></p> <p>(b) Put these facts about his <i>bribery</i> before the class. State the circumstances which led to it.</p> <p>(1) The fierce opposition he had to face.</p> <p>(2) The ease with which it could be done.</p> <p>(3) That it was an established practice</p> <p>(4) His too great love of power.</p> <p>(5) The lack of publicity.</p> <p>Give the true history of the famous phrase (b) (4). The Opposition were storming at him over this charge, when he retorted: "All these men have their price".</p> <p><i>"He durst do right, but he durst do wrong."</i></p> <p><i>An honest man.</i> In an age of bribery he was beyond bribes himself, and died a poor man, heavily in debt.</p> <p><b>3. (a) and (b)</b> Show that this was impossible in his day, but that it has all been done since. Both in this and in his Free Trade policy he was in advance of his times. Another testimony to his <i>wonderful foresight and excellent business capacity.</i> Show that the justification of his policy is to be found in our day rather than in his own; and that so firmly did he establish the national credit, that the public creditors began to contend who should be last paid.</p>

**DATES IN HISTORY.**

Whilst warring justly against "cramming," we must not be led to disregard dates. Some knowledge of dates is absolutely

essential to an intelligent comprehension of history. They are supposed to bear the same relation to history that the multiplication table bears to arithmetic. They are also called one of the eyes of history.

But it is useless to learn dates unless the *events* associated with them are learned also. Talk of the event, explain and illustrate it, and the date will become an enclitic to the event. The dates are best learnt through the events; not the events through the dates.

*Mnemonics* are not recommended as a rule. Often they want interpreting and learning themselves. Sometimes the mnemonic is remembered whilst the key is lost, and, speaking generally, it is doubtful if much is gained by their use. The best mnemonics are interest and repetition. There must be plenty of repetition, and the dates repeated must be few and important; but the repetition should follow, not precede, the events. Properly used, the dates may afford good training for the exercise of *memory*.

The chronological system of Mr. David Nasmith, Q.C., is a specimen of a good mnemonic system, which is simple and ingenious. It has this to recommend it, that it is based on space relations, and so presents a picture to the eye. It is as follows:—

Each decade is divided into nine squares, arranged in three rows of three each. These squares are surmounted by a top border, which always begins the decade; *i.e.*, contains the cyphers (0's). It will then be observed that the ones and the nines are at opposite corners, as are also the sevens and the threes, and that the five is always in the middle. It is claimed for this method that after a little practice the difficulty is not to remember but to forget. The event desired to be remembered should be entered under its proper date in the square. Professor Meiklejohn has paid it the great compliment of adopting it in his history.

1880		
1881	1882	1883
1884	1885	1886
1887	1888	1889

### THE BALLAD IN HISTORY.

**I Its Uses.**—Its chief uses in the teaching of history may be thus briefly enumerated:—

1. It adds *interest* to the study; for it presents history in its most attractive form.

2. From the association of rhyme, rhythm, and romance it becomes *easier to remember* than history taught in the ordinary form.

3. There is generally an *intrinsic charm* in a ballad from its quaintness or simplicity, or its subject.

4. A ballad answers one of the best purposes of history, for it develops and encourages *patriotism*—a love and pride in the country, its people, and their achievements.

5. It is an easy and favourable method for cultivating a *love for poetry*.

6. It cultivates the *social affections*—pity, admiration, and sympathy all being stirred.

7. It *preserves words and forms*, of which it would not be very easy to produce examples in other branches of literature.

**II. Its Description.**—It will be necessary to make the children thoroughly understand what a ballad is, at least in the higher classes.

1. **What is it?**—Originally it was a short narrative poem, with something of both the lyric and the epic in it. In fact, it was a sort of minor epic reciting in verse, and was usually designed to be rehearsed in musical recitative, accompanied by the harp.

Before giving this description briefly explain the terms "lyric" and "epic". Probably "recitative" will also require explanation.

2. **Its Subjects.**—These were epic in their nature, and usually dealt with the adventures of lovers and the mysteries of fairyland.

3. **Its Home.**—It was chiefly used by the minstrels of the borders of England, Scotland, Scandinavia, and Spain. But the true home of the ballad in our country was the northern part of England and the southern part of Scotland.

Point out these places on the map, and explain the term "minstrel".

4. **Their Quality.**—The Scotch are generally superior to the English, and the Scandinavian to all. The literary and dialectic (explain) peculiarities of the Scotch were most probably copied from the Scandinavian bards, for they resemble each other both in form and language.

5. **Their Popularity.**—They were immensely popular with the people, who were the custodians and guardians of them. The Normans despised the nature of poetry, because they did not understand it, and so they were left entirely to the people, from whom they have retained their simple and popular character. Then they were recited by their beloved minstrels, dealt with subjects which were popular and fascinating, possessed certain peculiarities which were indicative of the people themselves, and were often set to dance music.

### III. The Choice of Ballads.

**A. For the Lower Standards.**—The following principles should guide their selection:—

1. The subjects should be simple enough to *interest* the children.
2. The incidents should be such as would excite their *sympathy*.

3. The more *painful sides* of history should be omitted.

4. *Explanation* and sometimes *abridgment* will be necessary.

Guided by the above principles, the following list will most probably be found suitable :—

- |   |           |                                   |
|---|-----------|-----------------------------------|
| (a) The Mother's Book                           | - - - - - | by C. M. Yonge.                   |
| (b) The Battle of Evesham                       | - - - - - | " F. T. Palgrave.                 |
| (c) Wicliffe's Bible                            | - - - - - | " G. White.                       |
| (d) The True History of Sir Richard Whittington | - - - - - | " Author of <i>John Halifax</i> . |
| (e) The Queen's Oak                             | - - - - - | " C. M. Yonge.                    |
| (f) The Spanish Armada                          | - - - - - | " G. E. Maunsell.                 |
| (g) Victoria's Promise                          | - - - - - | " C. J. Coleridge.                |

**B. For the Higher Standards.**—There is not a large number to choose from, but the same principles should regulate their choice as for the lower standards. Copious notes, as a rule, will be necessary for Scottish ballads if chosen.

- |  |           |                      |
|--|-----------|----------------------|
| (a) Boadicea                           | - - - - - | - by W. Cowper.      |
| (b) Alfred the Harper                  | - - - - - | - " J. Sterling.     |
| (c) The Curfew Song of England         | - - - - - | - " Mrs. Hemans.     |
| (d) Robin Hood and Allan-a-dale        | - - - - - | - Old ballad.        |
| (e) Chevy Chase                        | - - - - - | - Old ballad.        |
| (f) Joan of Arc                        | - - - - - | - by F. T. Palgrave. |
| (g) The Battle of Flodden              | - - - - - | - " T. Delaney.      |
| (h) The Death of Essex                 | - - - - - | - Old ballad.        |
| (i) The Landing of the Pilgrim Fathers | - - - - - | - by Mrs. Hemans.    |

## BATTLES.

**I. Their Use in Teaching.**—These incidents may be made instructive if properly handled. The teacher must guard against the undue preponderance of the emotional element. The feelings of *patriotism*, *admiration for courage and suffering*, and all the finer traits of human nature which are supposed to be evoked by battles, should be allowed their due share of attention and existence; but the *intellectual* value must not be overlooked. It is suggested that some such treatment as the following should be adopted :—

**II. Instruction.**—A brief *description* of the campaign should be given, leading up to the particular battle in question. This will arouse interest. They should then be told distinctly the parties engaged in this particular battle, and the names of the leaders on either side. A rough *map* should be drawn on the B.B. showing the relative positions of the contending forces. The battle should then be described in sufficient detail to *give an accurate idea of the event*, and to maintain the interest which has already been evoked. A careful use of any *pictures* on the subject could be made with advantage.

**III. Education.**—The teacher should then try to make due profit out of it. For this purpose he should place the *causes* and the *results* before the class.

**1. Causes.**—Why were the armies opposed? Give the causes. Then show the many interests always tending for war—standing armies, military and naval classes, the ambitions of sovereigns or politicians, portions of the press, international greed and jealousy, contractors, aggressive commerce, feminine admiration for soldiers, the craving of the masses for change or excitement, and other causes.

**2. War.**—Why war? Ask for better methods of settling disputes. Discuss briefly their degree of practicability. Show that war has been the custom for ages in such cases. Point to modern cases of *arbitration*. Elicit and regulate opinion on the value and morality of war *versus* arbitration. Why is war more general than arbitration?

(a) Because of necessity. In most cases, at present, other methods are impracticable.

(b) Custom. This has already been referred to.

(c) Literature often encourages it, from the Bible down to the local newspaper.

(d) Refer generally to the "interests" mentioned in (1).

**3. Results.**—Some of these, like death, sickness, poverty, loss of trade, and increase of taxation, can easily be obtained from the class, especially if previous lessons on any battles have been given. The other, *specific and historic results*, both *direct*, as embodied in *treaties*, and *indirect*, as arising out of the treaties (e.g., the bitter feeling engendered between countries, as between France and Germany), should be told and impressed on the children.

## OUR INSTITUTIONS.

Few teachers are free from the cramping effect of codes and set syllabuses; perhaps, still fewer from examinations. Where these things exist, the teacher who wishes to preserve his official existence will always be largely guided in his teaching by them. But where the teacher is a free agent, he may adopt the **living method** of teaching, which is the best educationally and the most interesting. He starts with a contemporaneous fact—a building, a personage, an institution—and traces this fact back to its very source. This method adheres to the sequence of teaching by starting with the known and proceeding to the unknown. It vitalises the teaching by placing concrete objects before the class as a starting point, and it brings a living interest to bear upon the work. Such lessons would deal with:—

**1. Our Institutions.**—These would include Parliament, our Courts of Justice, our Fire Brigade, Local Bodies (Vestry, Corporation, School Boards, Asylum Boards, Charity Commissioners, etc.), our Army, Navy, Militia, and Volunteers.

**2. Our Historic Buildings.**—These would include such places as the Tower of London, our Cathedrals, the Houses of Parliament, our famous Castles, Universities, Palaces, Museums, Picture Galleries, etc.

**3. Historic Personages.**—See under the various remarks in this chapter about Biography.

**4. Our Towns.**—Their Growth, Trade, Development, etc.

**5. Inventions.**—These would embrace such things as the Railway, Steamboat, Photography, the various Electrical Inventions, etc.

**6. Education.**—As carried out by the School, Church, Press, Literature, the Stage, and our social institutions.

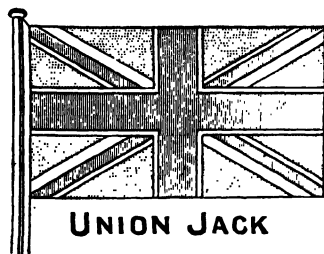
Such lessons must necessarily be largely descriptive, so that the teacher will need to cultivate his powers of word-painting. They are primarily lessons for imparting information, but their moral and intellectual sides need not be absent. Above all, they are calculated to make the pupils take a budding interest in the facts which surround them, and to develop a spirit of inquiry, and a power of social and political observation. They are essentially the type of lesson necessary to impress upon the schoolboy what will be his rights and responsibilities when he becomes a citizen. An illustrative lesson on the Union Jack follows.

### THE UNION JACK.

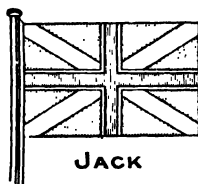
*Apparatus*—A Union Jack; pictures of "Herald" or of a Crusader; coloured chalks; strips of coloured paper for children; five-shilling piece; outline map on B.B. (see B.B. sketch).

#### I. Explanation of the term Union Jack.

Show a Union Jack. Explain the term *Jack* as the name of a coat once worn by a herald. Show picture of a Herald with an ornamented coat, or a



UNION JACK



JACK

 Red  Blue

picture of a Crusader. (*Cf. Jack-et.*) Proceed to explain that the patterns on these "Jacks" or coats were afterwards used to ornament flags.

Ask for a word similar to Union. Show that the expression *Union Jack* shows that *two or more "Jacks" or flags have been united.*

#### II. Preliminary Examination of a Union Jack.

Proceed to endeavour to separate the various flags. Get class to note the red and white upright cross, the red and white diagonal cross, the blue ground.

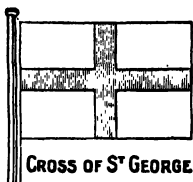
**III. The Cross of St. George.**

Select this as the most prominent feature of the Union Jack. Draw on B.B.

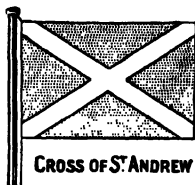
Show St. George and the Dragon on a five-shilling piece. Narrate story.

Explain that he is the "patron saint" (i.e., the guardian saint) of England.

Ask child to show position of England on the B.B. map.



CROSS OF ST GEORGE



CROSS OF ST ANDREW

**IV. The Cross of St. Andrew.**

Trace the white cross on the Union Jack. Sketch the St. Andrew's Cross on the B.B.

Explain that St. Andrew is the patron saint of Scotland.

Have position of Scotland pointed out on map. Note its situation as regards England. Compare sizes of Scotland and England.

**V. The Union of England and Scotland.**

Explain that once England and Scotland had different kings, but that about 300 years ago the king of Scotland became king of England, the two "Jacks" or flags were united, and the two countries became known as GREAT BRITAIN. Show that Great Britain is an Island.

**VI. The Cross of St. Patrick.**

Let children point out the cross that has not been dealt with.

Draw on B.B. Explain that St. Patrick is the patron saint of Ireland, hence the reason "Pat" is a favourite nickname for an Irishman.



CROSS OF ST PATRICK

Have position of Ireland pointed out on B.B. map. Compare sizes of Ireland and England. Show that Ireland is an island. Ask how we should get from London to Ireland.

## VII. The Union of Great Britain and Ireland.

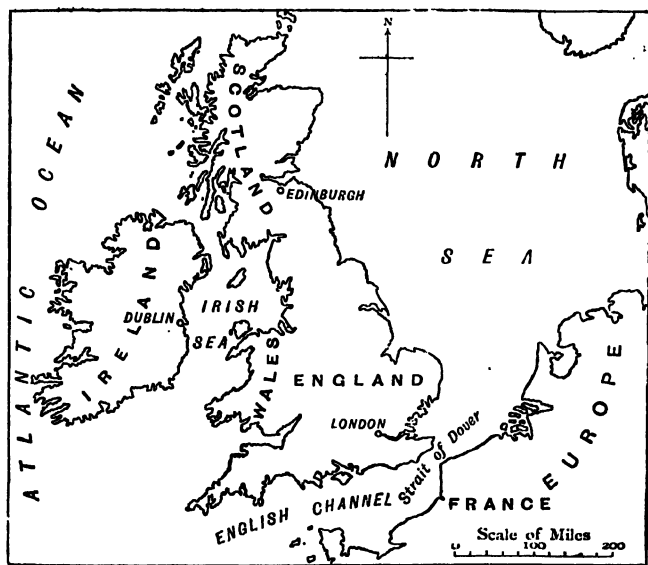
Explain that about 100 years ago Great Britain and Ireland were brought under the same government; the flag of St. Patrick was added to the Jack, and the Union Jack as we now have it was adopted.

## VIII. Position of the British Isles as regards Europe.

Distinguish the term British Isles from Great Britain by showing the constituent countries of each. Name capitals. Have the boundaries named as indicated in B.B. map. Get class to define position as regards the Continent.

[The children can be now directed to make the various flags with coloured strips of paper, and the next drawing lesson they can draw the Union Jack, etc., with coloured crayons.]

### B.B. SKETCH.



BRITISH ISLES.

Walker & Boutall sc.

British Isles.	{	Great Britain.	{ England and Wales.
		Ireland.	{ Scotland.



## EXAMINATION QUESTIONS.

1.—*Notes of Lesson* on the passing of an Act of Parliament; Joan of Arc; Cardinal Wolsey; some battle in English history; chief topic of the reign of one of the kings of England.

2.—Show the use of ballad poetry in the teaching of history, and illustrate your statement by some historical ballad.

3.—Write out the chief topics to be selected for a lesson on the reign of one of the kings of England.

4.—What plan would you follow in giving a description of some famous battle? Illustrate your answer by the battle of Flodden or Waterloo.

5.—Select points in the character of Lady Jane Grey, or Robert Bruce, or Nelson, that would be specially attractive to children, and write out some anecdote by which you would illustrate each point.

6.—Write out those dates of events in English history during the seventeenth century which you consider worthy of being committed to memory by children, and give reasons for your selection.

7.—Name some stories from English history that you have found to be most attractive to young children, and explain simply the causes of their attractiveness.

8.—It is sometimes said that one of the best ways of teaching history is by means of biography. Explain this. Name five or six persons whose biography would throw great light on the history of the eighteenth century, and give a slight sketch of one such biography.

9.—In giving a lesson on the Duke of Wellington, show what use you would make of comparison, and contrast with any other character in history.

10.—In teaching history, say what use, if any, you would make of chronological tables. Is it better to learn the date before or after the pupil knows something of an event, and becomes interested in it? Give your reasons.

*This chapter is continued in the Appendix.*

## CHAPTER XIV

### THE ENGLISH LANGUAGE.

THE teaching of English is said to comprise speaking with correct pronunciation, reading aloud with intelligence and clear enunciation, recitation, writing, oral and written composition, including spelling, grammar and the study of English Literature. Reading, Writing, Recitation and Spelling have already been dealt with. It now remains to deal with the other branches of the subject.

Language is composed of words, and words are the instruments of thought. Hence the bigger the vocabulary, the bigger the range of thought, the bigger the amount of new materials for knowledge. It will thus be seen that to acquire the mother tongue is something more than acquiring words. It includes not only the possession of the instrument, but the proper use of it. It embraces both the correct expression of our own thoughts, and the correct understanding of the expressed thoughts of others. There are various modes of expression, but the most necessary and the most universal is language. The growth of language marks the growth of thought in man, for the forms of language represent the forms of human thought. The study of language is therefore the study of humanity.

**Plan of Teaching.**—Formerly it was the custom to commence the teaching of Grammar with the lower classes of the school, and to defer the teaching of Composition until the upper classes were reached. Then it was generally agreed that Grammar and Composition should be taught concurrently. Now most authorities think that the teaching of Composition should precede the study of formal Grammar. Grammar is not the stepping-stone but the finishing instrument. We have passed through the stage when language was taught as a science; we recognise now that it should be taught as an art. Spoken language and poetry are both older than grammar, and reasoning is older than formal logic; hence

as grammar was made after language it ought to be taught after language. *The sequence then will be in accordance with natural development.*

There are other pertinent reasons for this arrangement. *It agrees with the general maxims of teaching*; for when a child first enters school he already talks and uses sentences, and in Composition he is introduced to sentences. By the examination and use of many sentences he observes how they are built up, and he learns to elaborate rules bearing on their structure and function. He thus commences with *particular* instances (sentences) and finishes with *general* laws (grammatical rules); he proceeds from the *known* (sentences) to the *unknown* (rules, laws).

The child who comes from a good home learns his language in the best of all natural ways—by the imitation of good models. Unfortunately, however, it is only for children of good parentage that the national language is the mother tongue. The teacher has generally to undo or counteract the results of home speech, and if this operation is deferred too late, illiterate speech may become habitual. The teacher's task is then increasingly difficult, and in some cases well-nigh impossible.

**Difficulties of Teaching Composition.**—Composition is not easy for children. Its demands are great and are never fully met by many, either during their school life or afterwards. These difficulties will include the incorrect English acquired outside the school, the limited range of the child's vocabulary, the paucity of the child's ideas, the lack of power to arrange those few ideas into a connected sequence, and its nature of a double acquisition in the oral and written forms.

In the **Infant School** the teacher will be concerned mainly with Oral Composition. Before entering the school the child has learned some English through the ear. Then through the ear, and in the earlier stages through the ear alone, the child should proceed to the acquisition of more correct English and to the correction of the faulty portions already acquired. The teacher's own example will be important. His language must be a well of English undefiled.

A series of Conversational Lessons on objects is perhaps the best method of commencing the teaching of Oral Composition. The work may be divided into three stages: (1) the presentation of the object, (2) the naming of it, and (3) the making of a state-

ment about it. The aim is to get the child to answer in complete sentences and to do some connected thinking by making several consecutive statements about the object. At the same time all errors of pronunciation should be corrected, and the use of false concords attended to. By the time the child is ready to be transferred to the senior school vernacular errors should have disappeared. Incidents connected with school life and home life, conversational lessons on a picture before the class, the habits of domestic animals and such natural phenomena as are well within the purview of the child, can also be used as subjects of Language Lessons. But lessons dealing with such objects should be given exclusively only in the earlier stages. Such lessons might result in the use of correct English, but not in the *love* of good English and of good literature, and this, after all, is one of the main objects of Language Lessons. The children are not too young for the cultivation of the æsthetic sense. Nursery rhymes, lullabies, fairy tales and fables can be recited, sung or narrated. The pictures in the reading books can be described, and the substance of the matter contained in the reading lesson narrated in the pupil's own words.

So far, the Composition should have been entirely oral. Towards the end of the Infant School course the eye may be sparingly appealed to. Sentences may be occasionally written on the B.B. and transcribed by the class. *Much* oral work should, however, precede all written work, for matter is as important as form. The power of apprehending meanings is essential to rapid progress in language; that is to say, the knowledge of things should be greater than the knowledge of words. It is for this reason, among others, that the Object Lesson is recommended for the early stages. The teaching needs to be objective to keep the verbal memory intelligent.

In the **Senior Department** the *younger scholars* will receive an extension and elaboration of the teaching received in the Infant School. The short story will still continue to be the principal means of teaching Composition. Occasionally the geography or history lesson may, for the sake of variety, be made to supply the theme. The "Mechanics of Composition"—punctuation, capitalisation and spelling—should receive careful attention. The subject-matter needs to be within easy mental reach, or it absorbs so much of the child's attention that it leaves little room for at-

tention to the elements of style. The human mind can attend to one thing only at a time, although it may shift the attention very rapidly.

The *outlines of a lesson* at this stage might be framed somewhat on the following lines. As preparation the story should be carefully selected, and any new or unusual words involved should be written on the B.B. and learned. The Composition itself will then be both oral and written, for, having been told or read to the class by the teacher in the first case, several children might be asked to repeat it orally, before the class is asked to write the story in their exercise books. Thus far there would be uniformity. The elaboration of the story would provide the variety which is so desirable. The advantages of such a method are that connected thinking is encouraged, and stereotyped phraseology avoided somewhat.

Written composition should not be delayed until a child can spell accurately. The vocabulary of an intelligent child will always outpace his orthography. What is wanted is freshness and originality, and this may be present although smeared with bad spelling. But in most cases the matter should still be supplied by the teacher, so that attention may still be secured to the forms of language. Objective descriptions, sentence-weaving, transcription, dictation, memory composition, the short story or word-building exercise may all be utilised. *Objective descriptions* should be oral in the first case and in most cases, for Oral Composition should be continued right through the school. The reason is that speaking is the sole foundation of the teaching of English. In *Sentence-weaving* a word could be given to the class, and they could be asked to write down sentences containing the word; or a subject or predicate could be given, and the rest of the sentence left to their own efforts. Then these sentences might be expanded, and so synthetically the compound and complex sentence might be built up. There need be no lack of variety. Sentences could be formed in connection with grammatical rules and definitions as the pupils progress up the school. Meantime they might be asked to change given sentences from the singular to the plural or conversely, to change tenses, active to passive, pronoun for noun, and so on. *Transcription* and *Dictation* are both good aids, especially if any of the simple beauties of the passage are pointed out. The copying of good models is always

advisable, for imitation and memory are both strong in children. In *Memory Composition* choice passages are learnt and written from memory ; but the method is too exhaustive and too expensive in time for wide practice. Nevertheless, it stores some valuable leaven which operates according to the mental stuff it has to mix with.

With the *older scholars* exercises should be given in direct and indirect narration, transposition, paraphrasing, original composition or essay writing, equivalence, word-branching, figures of speech, précis writing and versification. Age and attainments must be the guiding principles of choice. Every effort should now be made to improve the style, and to cultivate a taste for good English. Hence the older pupils will require to know more about the laws of punctuation, of the sentence and of the paragraph ; they will require some knowledge of idioms and the proper use of the various figures of speech ; they will need to possess certain mental qualities, like clearness and strength, and certain emotional qualities, like pathos and humour. Fluency will come with practice and time.

In **Transposition** a piece of poetry is stripped of its poetic garb. The first efforts should be confined to pure transposition. Later the transpositions might be made on a definite plan, *e.g.*, classical words might be exchanged for English words or phrases, and conversely, or figures of speech might be explained by others more simple, or by simple English ; elliptical sentences might be expanded, or all tautologies or redundances removed.

The lessons in **Paraphrasing** should be carefully graded. They might begin with single words for which synonyms or explanations could be given, and proceed through short phrases to sentences. Some of the transposed pieces might now be paraphrased, and the two results compared. New pieces might then be given. Some help might be given at first, but soon the pupils should be left to their own efforts. It is a valuable exercise, and possesses certain advantages which far outweigh any defects it may be said to possess. It is especially useful for fixing the local or context meaning of a word, for a paraphrase is often far better than a synonym. In choosing passages regard should be had as much to the ease, the dignity and the charm of the language as to the instruction which it may convey.

**Original Composition** or **Essay Writing** makes severe mental

demands upon the pupils, hence the subject-matter should be within the range of child life and child reading. The teacher may assist at first. He might run through the subject-matter, pick out its chief heads, put them on the B.B. and ask the class to write a paragraph on each. The chief aim is to encourage free expression, and for this reason he will avoid unfamiliar themes and lay sermons of the abstract virtue type. The pupils should also be taught the various methods of commencing and terminating various forms of letters.

**Word-building** is a type of composition lesson which may begin in the lowest classes of the Infant School and progress through all the departments. Word-building is a system of teaching by means of a course of progressive lessons leading up from the formation of simple sounds to the composition of words by means of prefixes and suffixes. It consists of two distinct divisions, syllable synthesis and verbal synthesis.

(a) **Syllable Synthesis** is the building up of a single syllable by assigning to it that combination of letters which usage has determined to be the conventional representation of its sound. This is the true inductive method of teaching spelling.

Primarily the teacher will have to deal with words of regular notation, and this synthetic process would lead to correct spelling in the languages of countries, which, like Italy, possess comparatively few cases of exceptional spelling. The method of teaching should be to speak the words before they are written, to give the sound and then the symbol. The object is to connect more firmly the sound with its ordinary combination of letters. The classes of words proposed to be taught should be plainly set out in progressive order; *i.e.*, words that can be taught both through the eye and the ear. In this way, groups of words connected by a common spelling (in each case) of the same sound can be reduced to certain visible and intelligible principles.

Owing to our imperfect alphabet it might almost be said that we virtually possess two separate languages, a spoken language appealing to the ear and a written language appealing to the eye. Then since our system of spelling is not purely phonetic, some arrangement must be made for dealing with anomalous words. For convenience these might be classified into (1) words of similar sounds but dissimilar letter combinations, and (2) words of similar letter combinations but of dissimilar sounds. Anomalous words

should be written on the B.B. before they are spoken, so that the teacher may be able to disconnect the same combination from its ordinary pronunciation; e.g., *one* should be disconnected from *l-one*, *b-one*, *st-one*. Since anomalous words can be taught by the eye only, for the purpose of teaching they should be limited to words in common use, and these should eventually be set out in lists. Such instruction, although included in the teaching, lies right outside the progressive course of lessons on word-building. Such lessons are subordinate to word-building, and are no real test of a good series of word-building lessons.

In *Infant Schools* the word-building lessons may be usefully restricted to the simple phonic teaching of the more common of the different sounds represented by the letters of the alphabet. It should be possible in *Infant Schools* to teach simple combinations, which might include, for example, all the simpler closed syllables, while relegating to schools for older scholars such difficult varieties of sounds as are conveyed, for instance, by the three sounds of the combination *ch* in *chin*, *charade* and *chasm*.

(b) **Verbal Synthesis**, or the combination of one or more syllables, of which the root word is composed, with prefixes and suffixes, such as the formation of nouns from adjectives, as *heavy*, *heaviness*, thus giving a training in the use of language, is the work of the upper schools and forms the chief part of word-building. The lessons should be progressive, rising from such simple forms as the more common terminations of nouns and adjectives and the suffixes denoting gender, to the formation of adverbs from adjectives or prepositions or other difficult combinations. There is no better exercise of the inductive method of reasoning, nor one more intelligible and interesting to young children. The addition, for example, of the suffixes *en*, *er*, *est*, *ly*, *ish* and *ness* to the word *sweet*, and the use of words so built in short sentences, will lead the scholars by simple induction from these and other similar words to determine for themselves the exact meaning of each suffix.

**Précis Writing.**—This is a process of analysis and condensation. It is a difficult exercise, demanding a grip of the salient points among a mass of detail in an essay, a speech, or a formal document, a power of logical analysis, a sense of proportion to distinguish between the most and the least relevant statements, the gift of efficient brevity for stripping off all super-



fluous verbiage and a facility of expression. But its difficulty is no reason why it should not be cultivated as a form of composition, since it is a useful exercise for the practical purposes of life and a good mental exercise for developing discernment and lucid thought.

**Versification.**—The late Dr. Fitch suggested the use of versification, but obviously such an exercise would have to be restricted to the advanced pupils in the secondary schools. By versification he does not mean the making of rhymes or the use of difficult metres; but he urges that “when the pupil is familiar with some good passage from Shakespeare, Milton or Wordsworth, and has caught the ring and movement of the English heroic measure, it is worth while to draw attention to the conditions which render that measure musical and effective, to the law of recurrent accents, and to the necessity of making the structure of the thought and the logical arrangement of the sentences fit in with the structure of the verse. Then it is a good exercise to give a subject, or a suitable extract from a book, and to require it to be reproduced in blank verse. This will be found to encourage the choice of diction, elevated a little above that of ordinary life; to give practice in conciseness and in the better arrangement of the thoughts; and to tune the ear to a truer perception not only of the melody of verse, but also of that of rhythmical prose.”

**Lessons on Synonyms.**—Such lessons would need very careful grading. In the primary school their scope would be limited, but for the higher classes it has been suggested by good authorities that synonyms may be much more liberally asked for by adducing figurative and poetical as well as scientific equivalents. The field is a rich one, for the equivalents in some cases, *e.g.*, as in birth, life and death, are practically inexhaustible. But synonyms are rarely quite identical. They either give different shades or degrees of meaning, or they present a thing from different points of view, or they are more or less vague or precise. This prevents their indiscriminate application. To point out these differences is to give a lesson in the subject-matter and not in the expression. Such lessons, it has been wisely said, are not to be entered upon at random. As a rule, their more delicate shades of meaning must be left to be gathered by subsequent experience. As Professor Raymont has pointed out, the temporary result may be a malaprop use of words; but the permanent utility will be a

command of terms for the purpose of selection. The teacher will thus enlarge the pupil's vocabulary by adding to his stock of equivalent names.

**The Correction of Composition Exercises.**—In the primary school the correction of exercises presents many difficulties owing to the still existent large classes, and also to the fact that the primary teacher rarely has any "time off" for the purpose of correction. This difficulty is not so apparent in the secondary schools, although the total amount of "marking" to be done in such schools by no means leaves the difficulty non-existent. But whatever the staff difficulties may be, every Composition Exercise should be properly corrected. Such exercises often have to be corrected out of school hours, but with a little ingenuity the encroachment on the teacher's leisure may be materially economised. For instance, opportunities may present themselves during a silent reading lesson, or during a lesson when the class is doing memory work, or when two or more classes are massed for special or "class" subjects like singing or drill, or during an arithmetical test exercise provided each child has a separate test; but in no case should proper supervision be sacrificed.

The common mistakes may be classified, and some suggestions for dealing with each class of error are now suggested. *Errors in Spelling* should be underlined by the teacher, and during a subsequent lesson should be corrected by the pupil and repeated correctly to the teacher. The most common *errors in Grammar* should be noted down in a special book. These might then be dealt with in the Grammar Lesson. In fact, every school should have its own list, gradually compiled, of the errors commonly committed by the children, and much of the grammatical instruction should be based on this list. Grammatical exercises of this kind should be distributed throughout the years of school life, but should not be allowed to dominate the teaching of English. *Errors in Punctuation* are perhaps best corrected by inserting the appropriate stops. Punctuation is best taught by directing attention to punctuated passages during the reading lesson, by transcription and dictation. *Errors in Style* will require most attention in the Senior Classes, for it is not until the pupil commences to write long sentences and to use the more uncommon words that errors in style will arise to any appreciable degree.

Sentences faulty in style should be repeated to the class, or written on the B.B., and the pupils should then be asked how the sentences might be improved. Confused arrangement, awkward repetition of words, tautology and pleonasm are some of the more pronounced errors in style.

**Introduction of Formal Grammar.**—The teaching of Grammar should not begin before the child has reached ten years of age, as the aptitude for Grammar in its true sense does not exist before that age. The choice and amount should be just so much as will help and illustrate their composition. Just as the sentence was made the starting point of Composition, so it should be the starting point for teaching formal Grammar. For the sake of clearness the teaching of formal Grammar is considered apart from the teaching of Composition, but the two should proceed concurrently. And here it may not be out of place to answer the pertinent question that since children can be taught to speak and write correctly by imitation alone, why teach any formal Grammar at all?

Mr. Currie says that the study of Grammar has an important bearing on the pupil's practical acquisition of language. For since all its rules are drawn from language as actually used, it is necessary that correct examples should be submitted to his observation, and that he should try the language that he meets with by the rules which he learns. Grammar thus furnishes him with a criterion for judging of the correctness of expressions, by which, on the one hand, his imitation of those which are correct is more confident, intelligent and rapid, and on the other, he is fortified against the influence of incorrect examples. And again, although the capacity for thought is inborn in every human being, nevertheless language is indispensable for the development of the higher activity of intellect in the child, hence it is a fair inference that "a more commanding knowledge of it than habit alone can give must be deemed a necessity of education, and particularly of all education which pretends to cultivate the mind". Furthermore, it is one of the best, perhaps the very best aid the young scholar has to abstract thinking. Logic and Mathematics are par excellence the subjects involving the necessity of abstract thinking, but these subjects fall only to the few, whereas Grammar falls to the many. Then if we summarise these reasons, we can say that Grammar should be taught be-

cause of its practical connection with Composition and Language teaching, and because it provides a valuable training in abstract reasoning.

Now when we examine what parts of formal Grammar are necessary to a correct understanding of the principles of Composition, we shall perhaps be somewhat astonished at the small amount of formal Grammar actually needed. Our first grammarians were Latin scholars, and so treated English as though it were a synthetic language like Latin. Hence we find terms introduced which are of little utility in the explanation of an analytic language like English; terms which require simplification; terms which are inappropriate.

**The Essential and Non-Essential Parts of Formal Grammar.**

— The chief sources of error in early efforts at Composition are the agreement of the Subject and Predicate, the case of Pronouns and the sequence of Tenses. To these may be added those mistakes connected with the Comparison of Adjectives and Adverbs. Hence the essential parts for teaching seem to be Number, Person in Pronouns and Verbs, Case of Pronouns, Tense of Verbs and the Comparison of Adjectives and Adverbs. Less essential, but permissible, is the teaching of Proper and Common in Nouns as an aid to capitalisation; Transitive and Intransitive Verbs as an aid to determining Case; and Voice as an auxiliary of Composition Exercises of the Sentence-weaving type.

Some parts of Formal Grammar are not essential for the purpose in view. The classification of each part of speech, of Nouns into Abstract and Concrete, of Adjectives into Quantity, Quality, etc., of Prepositions and Conjunctions into classes and sub-classes are grammatical luxuries and not language necessities. Gender is a grammatical distinction hardly existing in English, whilst Regular and Irregular (or Weak and Strong) Verbs are an anomalous classification. Mood also is superfluous because modern English has so little variation for its expression.

**Difficulties in Teaching.**—“The difficulties of grammar are the difficulties of all science—generalities couched in technical language.” The difficulties arising out of language itself are great. for children in elementary schools rarely hear good English outside the school. Their vocabulary is very limited, and there is little or no power of arrangement in the formation of new sentences. Their use of language is often irregular, and these

irregularities occur most frequently in the most common phrases where language is most idiomatic. Nor are the mental difficulties any less, for it requires greater mental power than most school subjects. It is a double acquisition, for there is the union of language with thought. The mind is divided between the two, and words are sometimes confused with things. Some of its stages require great power of concentration, and this is a thing of slow growth. Finally, there is a great deal of drudgery in the task. A skilful teacher may gild the drudging pill, but it has to be taken, and drudgery is not a strong point with many.

**Plan of Teaching.**—Analysis should be dealt with before Parsing, for, like Composition, Grammar should be taught through the Sentence. Logical Analysis should precede Grammatical Analysis, and the Parts of Speech should be taught through Analysis. The Noun can be developed from the Simple Subject, the Verb from the Simple Predicate, the Adjective from the Enlargement of the Subject or Object, the Adverb from the Extension of Predicate, and the Pronoun can be taught as the substitute for the Noun Subject or Noun Object. The Preposition can be viewed as a connective of words, the Relative Pronoun and the Conjunction as connectives of Sentences.

**General Plan of a Grammar Lesson.**

**I. Inductive Process.**

1. *Preparation of Examples.*—A number of examples should be collected which illustrate the point to be taught. These examples may be prepared by the teacher or selected from the scholars' composition exercises, or in some cases supplied by the children themselves at the commencement of the lesson.
2. *Manipulation of Examples.*—Questions should be asked upon the examples, so as to bring into special prominence the words, phrases or sentences which really supply the material of the lesson.
3. *Induction from the Examples.*—Special attention should be drawn to the form or function of the words, phrases or sentences, and the children should be led to embody the results of their observations into a Statement, Rule or Definition. A statement embracing the leading characteristics of the word or group of words dealt with will often be better understood by the children,

and will be of more service to them than any set or formal definition. The definition, if any, need not be full, but should be accurate as far as it goes. In some cases the Statement or Definition should be committed to memory.

II. *Deductive Process*.—Other sentences should be supplied, preferably by the class, which contain the point especially dealt with during the lesson, and the knowledge gained from the Inductive Process should be applied to these new cases. Grammar should be learned inductively and applied deductively.

**Mistakes in the Teaching of Grammar**.—Grammar easily lends itself to faulty teaching. Definitions or principles are taught first. The lesson then consists of the learning of the definition and the application of it. The whole of the Inductive process is omitted, and a most valuable instrument for cultivating the reasoning powers of the child is thereby neglected.

Words are confused with things, and the language lesson thus becomes an object lesson. The material thing "slate" is pointed to and called a noun; sex is confused with gender, as when women are spoken of as "feminine gender"; descriptive adjectives are confusedly used, as when in the phrase "the large jug," the word "large" is parsed as an adjective describing "jug". It is true "large" may be part of the description of the *thing* jug, but it is no part of the description of the *word* jug, which is not a large word at all, but one of three letters only. Another common error is the confused teaching of the Possessive Case. In the phrase "a woman's dress," "woman" is sometimes parsed as possessive case, possessing dress. The *thing* "woman" may possess the *thing* "dress," but the *word* "woman" cannot possess the *word* "dress".

Too much assistance may be given. Often the teacher, in his anxiety to "get the children on," does all the thinking, whilst the children do merely the mechanical answering. If the young teacher will remember what has been said in Chapter V. on Questioning and Answering, he will receive some aid towards the avoidance of this too common error. The superfluous assistance may take the form of supplying mechanical aids. Lists of prepositions, conjunctions, etc., are given to the class to be committed to memory. The child is thus taught to classify according to the *form* of the word rather than according to its *function*—to rely upon his memory rather than upon his reasoning powers.

A few illustrative lessons are now given as suggestive aids to the young teacher.

### **Notes of a Lesson on Adjectives, Adjective Phrases, and Adjective Sentences.**

#### **I. Introduction of Examples.**

Previous to lesson, have some examples (of which the following may be regarded as types) written upon the B.B. :—

- (1) We walked through the wet grass.
- (2) We walked through the grass damp with dew.
- (3) We walked through the grass which was moist with the evening dew.
  - (a) I thrice presented him a kingly crown.
  - (b) I   "       "       "       " a crown fit for a king.
  - (c) I   "       "       "       " a crown which a king might wear.

#### **II. Manipulation of Examples.**

1. Have sentence (1) analysed and the word *wet* parsed.
2. Ask for words in (2) and (3) which are used instead of *wet*.

Compare and contrast (2) "damp with dew" with (3) "which was moist with dew". Each expresses an idea, but (3) contains a finite Verb, whereas (2) does not. Teach the term *Phrase*.

#### **III. Introduction of Terms.**

1. Review again—
  - (a) "Wet" is an Adjective.
  - (b) "Damp with dew" is a phrase doing the work of an Adjective.
  - (c) "Which was moist with the evening dew" is a sentence doing the work of an Adjective.
2. Draw some such definitions as the following from the class :—

*A Phrase* is a group of words which expresses an idea, but which does not contain a finite Verb.

*An Adjectival Phrase* is a phrase which does the work of an Adjective.

*An Adjectival Sentence* is a sentence which does the work of an Adjective.

#### **IV. Practice by Class.**

- (a) Take a sentence containing an Adjective and require its expansion into an Adjective Phrase and an Adjective Sentence ;  
e.g. :—

1. A traveller met a *hungry* man.
2.   "       "       "       " a man *exhausted from want of food*.
3.   "       "       "       " *who had not tasted food for two days*.

(b) Similarly, compress an Adjective Phrase into an Adjective, and expand it into an Adjective Sentence—

1. Ingratitude, *more strong than traitors' arms*, quite vanquished him.
2. *Deep and base* ingratitude quite vanquished him.
3. Ingratitude, *which wounded him more than traitors' arms*, quite vanquished him.

(c) Next compress Adjective Sentences into Adjective Phrases and into Adjectives.

The B.B. sketch will consist of the sentences and definitions as shown in the notes above.

### Outlines of a First Lesson on the Adverb.

1. Have the following simple sentences written on the B.B. :—

- |                                      |   |
|--------------------------------------|---|
| (a) The man walked.                  | The man walked slowly.                                    |
| (b) John rose.                       | John rose early.  |
| (c) The girl sees the horse.         | The girl often sees the horse.                            |
| (d) The dog served an unkind master. | The dog faithfully served an unkind master.               |
| (e) The King smiled again.           | The King never smiled again.                              |
| (f) The man spoke.                   | The man spoke softly, quickly, slowly, then, soon, again. |

Ask the class to supply a word which tells *how* the man walked, *when* John rose, etc. Add appropriate words so that the sentences appear as shown in the right-hand column.

2. Let a child read sentence (a) and say what parts of speech *The, man* and *walked* are, and give reasons for his answers. Proceed to *slowly*. Elicit by questioning that it is neither a Verb, nor a Noun, nor an Adjective. The child will then *infer* that *slowly* is a new part of speech. Deal with the other sentences in a similar manner, and underline on the B.B. the words which are new parts of speech. The child will then *infer* from these sentences that the words underlined are new parts of speech.

3. Examine farther the new parts of speech to discover their functions in the sentence. Ask which makes the better sense, *man slowly* or *walked slowly*. Proceed with the other sentences, and note the part of speech to which the new part of speech seems linked. The child will then *infer* that each of the underlined words is closely connected with a Verb.

4. Then introduce the term **Adverb**. Take the sentence, "His house adjoins ours". Elicit, by questioning, that "adjoins" means "joins to," and that consequently *ad* means *to*. Write the word *verb* on the B.B., and ask what syllable must be prefixed to make a word mean *to a verb*. An Adverb is closely connected with a Verb. Carry the examination still farther, and take the



sentences in (f). Again pick out the Adverbs and the Verbs with which they are connected. Ask if we have the same idea of *speaking* in the phrase *spoke loudly* as in *spoke softly*. The child will then *infer* that Adverbs slightly change the meaning of Verbs.

5. Now get a preliminary definition from the class. The word "modify" hardly comes within a child's vocabulary, and had better be told to the class. The class should then be able to say that *an Adverb is a word which modifies a Verb*.

6. The definition should then be applied. The class should be asked to supply Adverbs to sentences given by the teacher; to build sentences round Adverbs supplied by the teacher; and finally to supply original sentences containing Adverbs. Reasons for the choice should be asked for in each case.

7. The class should be asked to repeat the definition, and then write it from memory.

The student will discern that the lesson starts with the examination of *particular* cases (words in sentences), and leads up to the idea of a *class* of words (Adverbs); that the method of the lesson from par. 1 to 5 is Inductive, and that par. 6 is Deductive.

### How to Teach the Case of the Relative Pronoun.

I. Write on the B.B. the following or similar sentences:—

1. This is the house *that* Jack built.
2. I know a man *who* draws well.
3. I saw the dog *whose* head you patted.
4. I defended the man *whom* he slandered.

Ask the boys to point out the relative pronoun in each sentence, and underline it on the B.B. It is assumed that the class can recognise a relative pronoun. The difficulty to be cleared is one of case only.

II. Let the class orally *analyse* the sentences on the B.B., the teacher correcting where necessary.

Sentence.	Subject.	Predicate.	Object.	Extension.
1 } This is the house 2 } That Jack built.	This Jack	is the house built	that	
1 } I know a man 2 } Who draws well.	I who	know draws	a man	well
1 } I saw the dog 2 } Whose head you patted.	I you	saw patted.	the dog whose head	
1 } I defended the man 2 } Whom you slandered.	I you	defended slandered.	the man whom	

III. Now proceed by a few carefully graded questions to elicit the case in each sentence ; thus :—

1. Elicit the *antecedent* in each sentence.
2. Use the analysis to determine *to which sentence the relative belongs*.
3. Next elicit the *function* of each relative. In each case call attention to its position—subject or object—which indicates its function. The subject is in the nominative case; the object in the objective case. This will explain all except *whose*. For this question substitute, and the case is recognised, *e.g.*, whose head?—the dog's head. What is the case of dog's?—*whose* is the same case.

IV. A collection of common errors should now be submitted for correction ; *e.g.*, Who did you say? I don't know who you mean. Who did he do it for? etc.

### How to Teach Word Building. Lesson on Prefixes.

Deal first with the **native elements**, commencing with the *prefixes*, and afterwards taking the *suffixes*. The *root* will be taught with both the prefixes and suffixes.

**Prefixes.**—1. Write words like the following on the B.B., and let the class divide them into syllables :—

Afternoon equals after-noon.	Gainsay equals gain-say.
Forbid       "   for-bid.	Inborn       "   in-born.
Foretell     "   fore-tell.	Misdeed     "   mis-deed.
Offshoot    "   off-shoot.	Midday      "   mid day.

2. The class should next be asked to say *which is the more important part of the word* in each case. This they will tell from—

- (a) Its meaning.
- (b) Its function.
- (c) Its capability for independent work and position.

These will be given as **-noon, -bid, -tell, -shoot, -say, -born**, etc. Tell the class these are the **roots**. Compare with the roots and branches of a tree. The class should then *define* or describe a root, and give examples.

3. It should next be noted that the remaining parts of the words are—

- (a) Placed in front of the roots in each case, *i.e.*, they are **preplaced**.
  - (b) That they are joined to or **fixed** on to the roots.
- Hence they are called **prefixes**.

4. Plenty of *examples* should now be supplied, which should be dealt with both synthetically and analytically.

- (a) **Synthetically.** *Roots* can be supplied by teacher or class, and suitable prefixes can be added.
- (b) **Analytically.** *Words* can be supplied for analysis ; *e.g.*, misdeed ; *mis-* (prefix), *deed* (root).

5. The meanings of the words should now be educed, and little verbal or written exercises in **composition** embodying these words should be given.

### A Lesson on Some Methods of Forming the Plurals of Nouns.

1. Write on the B.B. a number of carefully selected words, e.g., *cat, boy, box, lady, gas, bench, leaf, chief*, etc.

2. Ask the class to give the plurals in each case, and write the plurals on the B.B. Then arrange the plurals in classes, the pupils making the classification in each case; e.g.:—

<i>cat, cats</i>	<i>box, boxes</i>	<i>lady, ladies</i>	<i>leaf, leaves.</i>
<i>boy, boys</i>	<i>gas, gases</i>		
<i>brief, briefs</i>	<i>bench, benches</i>		

The class should then be invited to note the different methods of forming the plural.

(a) By the addition of *s* to the singular; (b) By the addition of *es* to the singular; (c) By the changing of the final *y* into *i* and the addition of *es*; (d) By the changing of the final *f* into *v* and the addition of *es*.

3. The class should now be invited to supply other nouns whose plurals are formed in any of these four ways. Many words will be given under (a), but few under (b), (c) and (d).

4. Then get the class to infer that **the most common way of forming the plural of nouns is as in (a).**

5. Deal next with (b). Ask for other words whose plurals are formed purely by the addition of *es*; e.g., *lass, bench, church*, etc. Call attention to the final consonants, *s, x, z* or *ch*, and get the class to infer that **nouns ending in *s, x, z* or *ch* form their plurals as in (b).**

6. Deal in a similar way with (c). Then contrast the plurals of such words as *boy, alloy, buoy*, etc., and *lady, cry, belfry*, etc.

Get the class to notice that in some of the words (*lady*, etc.) the *y* is always preceded by a consonant, whilst in others (*boy*, etc.) it is always preceded by a vowel. Then get the scholars to deduce the rules.

(1) **Words ending in *y* after a consonant form their plurals by changing *y* into *ies*, as *baby, babies*.**

(2) **But if the *y* is preceded by a vowel they follow the general rule, as *toy, toys*.**

7. The class of words in (d) should be handled in the same way as those in (c). Such cases as *leaf, leaves; wharf, wharves; sheaf, sheaves*, etc., should be contrasted with *chief, chiefs; brief, briefs; relief, reliefs*, and the rules deduced accordingly.

8. A number of examples should then be given on the B.B., the class should then write down the plurals in their pencil work books or otherwise, and should be afterwards individually and orally called upon to give the reasons for their answers.

*Note.*—A lesson of this kind can be made just as short or long as the teacher determines. The whole of the notes here given need not necessarily be used in one lesson. The amount will always depend on local circumstances. A little and well should be the aim.

**Outline of a Lesson on Transitive and Intransitive Verbs.****1. Manipulation of Examples.**

(a) Previous to the lesson, write on the B.B. seven or eight examples of which the following are types:—

(1) *Boys make.*

(2) *Girls skip.*

(b) Have the phrases divided into two classes:—

(1) Those in which the sense is complete.

(2) Those in which the sense is incomplete.

Finish the incomplete sentences; e.g., *Boys make kites.*

(c) Draw attention to the fact that in *Boys make kites* the action expressed by "make" seems to pass over to "kites". Contrast with "skip" in *Girls skip*.

**2. Introduction of Definitions.**

(a) From the meaning of *trans* in *transport*, *transmit*, etc., infer that *trans* means *across*. Introduce the term *Transitive*, and explain its meaning. Deal with *Intransitive* in a similar way.

(b) With the help of the class draw up the definitions:—

(1) *Transitive Verbs express actions that are carried over to objects.*

(2) *Intransitive Verbs express actions that are not carried over to objects.*

**3. Learning of Definitions.**—Have the definitions repeated collectively and individually until they are well known.

**4. Application of Definitions.**

(a) Write some more sentences on the B.B., let the class select the verbs, classify them and state reasons for the classification.

(b) Let the class furnish examples.

(c) Have examples selected from the Reading Books.

**5. Examination.**—Call upon individual scholars to repeat and apply the definitions.

*Note.*—The question of Transitive Verbs in the Passive Voice should be excluded from a first Lesson.

**Notes of a Lesson on the Indirect Object.****1. Manipulation of Examples.**

(a) Previous to the lesson write on the B.B. six or seven sentences, of which the following may be regarded as types:—

(1) *He sent me.*

(2) *He sent the book.*

(b) Let the class analyse the sentences and then parse the Objects (*me*, *book*, etc.).

(c) As far as possible combine two Objects into one sentence; e.g., (3) *He sent me the book.* Also write on the B.B. other sentences, each containing a Direct and an Indirect Object; e.g., (4) *I gave him the slate.* (5) *The girl brought her the milk.* (6) *The tailor made the boy a coat.* (7) *They offered him it.*

(d) Have these sentences analysed. Direct especial attention to the Objects; contrast the forms *me*, *him*, *her*, etc., with *I*, *he*, *she*, and show that the former must be in the Objective Case.

**2. Deductions from the Examples.**

(a) From the previous considerations deduce: *After some Verbs there can be two Nouns or Pronouns each in the Objective Case.*

(b) Contrast as follows: He sent *the book*, he did not send *me*; I gave *the slate*, I did not give *him*; and tabulate the Objects as shown in the B.B. sketch.

(c) Re-write the sentences thus:—

(1) *He sent the book —me.*

(2) *The tailor made a coat—the boy.*

(d) Have the spaces filled up and deduce—

(1) *One of these Nouns or Pronouns is governed by the Verb in the Predicate and is called the Direct Object.*

(2) *The other is governed by some Preposition, generally "to" or "for" (which may be expressed) and is called the Indirect Object.*

**3. Introduction of Definition.**

Assist the class to draw up some such definition as the following: *The Indirect Object is used after some Verbs to complete the sense. The words "to" or "for" can be generally expressed before the Indirect Object, but these words are not necessary.*

**4. Application of Definition.**

(a) Write some fresh examples on B.B.

(b) Let the class select others from the Reading Books.

**5. Examination.**

Give a few sentences containing Indirect Objects for analysis in exercise books.

**Blackboard Sketch.**

He sent me.

He sent the book.

He sent me the book.

I gave him the slate.

The tailor made the boy a coat;

The girl brought her the milk.

They offered him it.

*Closely connected  
with the Verb.*

*Not closely connected  
with the Verb.*

book  
slate  
milk  
coat  
it

me  
him  
her  
boy  
him

**Direct Objects.**

**Indirect Objects.**

He sent the book **to** me.

The tailor made a coat **for** the boy.

**The Indirect Object** is used after some Verbs to complete the sense. **To** or **for** can be often expressed before an Indirect Object.

**The Teaching of English Literature.**—"The object of the teaching of English should be to develop in pupils the power of thought and expression and the power of appreciating the contents of great literary works, rather than to inculcate a knowledge of grammatical, philological and literary detail." Literature then should be studied for the purpose of training the imagination and of developing the æsthetic faculty. Training in the right use of language will follow as a subsidiary, but a necessary consequence. Young as the children are, they are not too young to appreciate good literature, for some of our most exquisite poetry owes its beauty to its simplicity, and its general purport is well within the comprehension of the child. The mind of the child grows synthetically. It is like a plant, and the teacher's business is to play the part of gardener. He has to supply the best conditions for growth; to wait on nature. Environment is very important, but heredity will count. There must be latent within the child the tendency to appreciate good literature, otherwise the teacher's efforts will be more or less fruitless. Most normal children, however, have this germ of appreciation.

Mr. Magnus writes well on this subject. He says that "if the new learning is to replace the old in our national system of education, English Literature will bear the burden of that discipline in taste and character which has been borne so honourably and so long by the classics of antiquity. It must be left to teachers to discover for themselves the right methods of study. Already it is becoming fairly clear that certain time-honoured modes will have to be discontinued. There is a general agreement—and any point of common meeting is welcome—that the history of English Literature and the contents of English letters are two very different studies. The kind of knowledge which is gained by reading up the lives of authors, with lists of their works and dates, and reproducing the result as accurately as may be, is valueless as culture and discipline. If English Literature is really to take its place as a serious mental discipline, we must rid ourselves of the old limitations. One wants to teach children *how* to read, to help them to hear with trained ears the most perfect and melodious speech which the lips of man have ever uttered, and to appreciate at its right value an art which is no mere ornament, but an interpretation of the life of man."

**The Nature of the Study.**—The above paragraph reveals to

us somewhat the nature of the task before the teacher. A knowledge of words is the beginning of judgment in literature, but the use of language is logically distinct from the study of literature. Instruction in the English Language will enable a pupil to understand, it will supply the mental element, but that power of appreciating the contents of great literary works, of which we have already spoken, is over and above this. The one is a necessary aid to the other; no more. Language produces the intellectual element; Literature the emotional. Intellect and feeling support each other to produce that state or condition known as the æsthetic.

**The Study of Poetry.**—The nature of the study leads to the consideration and teaching of poetry, which the teacher will find a more difficult task than the treatment of prose. Part of his work will be to help the pupils to recognise that poetry is one of the roads, like science and philosophy, which leads to truth; for “there is a truth of poetry as there is a truth of science”. But the point of view or mode of presentation is different, and it is requisite that the class should know and feel this if true appreciation is to follow. The primary aim of science is to explain phenomena; of literature to feel their beauties. Science satisfies the intellect; poetry gratifies the emotions. “Science, seeking sensational truth, reaches God by the road of observation; Art, pursuing emotional truth, reaches Him by the road of interpretation, and while Science calls His work necessary, Art discovers it to be beautiful. But the necessary and the beautiful are *one good*.” This does not mean that Science is all intellect and Art all emotion. Intellect and feeling are present in both—but in different proportions.

As the pupils become familiar with their anthology of verse they will begin to recognise great variety in the forms of poetic composition. This will be the teacher’s opportunity for pointing out that the poem shapes itself according to the inspiration of the writer; according to his mental endowment; according to his financial circumstances; or, it may be, according to the approved poetic forms of the age. The age may encourage one form of verse and frown on another; while a poem made to order sometimes lacks inspiration.

By this stage the scholar should have grasped the fact that poetry is a mode of expression the soul of which is feeling; that

it is as natural a form of expression as the cry of the child. The child feels and cries, and the cry depends upon the nature of the feeling. The real poet feels and writes, and the form of his poem will depend upon the nature of the thought that generated his emotion, for the greater part of poetry lies in the thought and not in the form. The thought fashions the form, and in that form only can the poet make his meaning most clear. Style and thought should go together, but in fitting proportion. A careful selection of examples by the teacher will show that some poets have more thought than style, as in the case of Walt Whitman's *Leaves of Grass*, or more style than thought. Mr. Magnus quotes Coventry Patmore's *Winter* as a case in point.

Some of the teacher's best efforts will be devoted to the language of poetry, and here there is plenty of scope for good teaching. He will show that poetry is especially rich in *metaphors*, and so help the class to see that the use of metaphors is the greatest resource of poetical language; that the value of the metaphor is twofold. (1) "It is pictorial, introducing variety and colour into the material design; (2) it is a means of interpretation, an aid to the conveyance of thought from one mind to another" (*Magnus*).

The child's earliest conception of poetry is limited by *rhyme*. The jingle of the similar sounds, repeated at regular pauses, is the musical or emotional element, and the characteristic that appeals most readily to childhood. To the child rhyme and poetry are synonymous. Soon, however, he begins to learn that there is poetry without rhyme and rhyme without poetry. But even at this stage and after what has been said about the varied forms of expression in poetry, he may still wonder why some verse is rhymed and other verse blank. Nor can the teacher altogether dispel his wonderment. He cannot tell the scholar when rhyme is appropriate and when not. What he can do is to show that to some extent it will depend on the form of verse adopted. He will be able to point out from selected examples that it is a more general characteristic of short than of long poems, and he may be able to suggest some probable reasons for the fact. In a long poem the rhyme might cloy. Again, the long poem has less need of it, for the length of the poem admits of a variety of forms or styles, which advantage is denied to the short poem. He would be able to show that in the drama it would weaken reality, for



men do not converse in rhymes. He would thus be led to see that rhyme is not essential to poetic style; that it is merely an occasional luxury.

Similar teaching would deal with the use of *rhythm*, and would introduce the pupil to the varied forms in use, to their varied effects, and perhaps later on to their varied names. "Apt *alliteration's* artful aid" would also be dealt with, and the effective use that may be made of sound words (*onomatopoeia*). The differences between colloquial and literary language will be incidentally learned—though better in prose than in poetry—and the pure use of words encouraged. But *purism* must not be pushed to the point of pedantry. Ruskin is a great advocate of this purism. He says that whenever we are in doubt about a word we should get a good dictionary and hunt it down patiently. He also advises that we should read Max Müller's lectures on the Science of Language; and after that, never let a word escape us that looks suspicious. The spirit of this teaching is good and should be adopted, although Max Müller will have to wait for later days than school life. But purism is a device of style which has a special danger of its own. It may neglect too much the current signification and living spirit of words, and so the purist may become archaic in his vocabulary. He may fail to recognise the limits imposed on his choice of words by the vitality of language; and it is in such cases that the danger of pedantry arises.

**How to Study an Author.**—As our greatest poet we will take Shakespeare as an example. Under the new learning the cult of Shakespeare is being pushed vigorously in many of the schools of the country. It is true he is absent from some, but in others he is perhaps too much present, to the exclusion of ballad poetry and simple classical prose. The best training in literature will be obtained from a selection of choice works and choice authors, and so far as young children are concerned, with texts specially prepared for them; and this preparation should be done very carefully, with some sort of consciousness of the particular wants of particular children.

A similar care should be exercised over the *selection of the plays* to be studied. The books selected should be well got-up, illustrated and the songs included. These songs could form part of the music syllabus for the school. The plays should be introduced by Lamb's *Tales* or some similar work; or the children

could lead back from the play to Lamb's *Tales*; or a short description could be told by the teacher. The first and third methods are preferable, as they proceed from the simple to the complex, stimulate curiosity, and gratify in the right sequence that love of story-telling which is common to all normal children. An edition of Lamb's *Tales* should be chosen, which not only gives the prose story, but supplements that story with some choice scenes from the play itself.

The *order of selection* should also receive attention. Such as "deal with fairies, suitable fun, fighting, are touched with adventure, and hallowed by human love" should afford the first choice; and answering to these tests will be found "A Midsummer Night's Dream," "As You Like It," "Much Ado About Nothing," and some of the historical plays. In the earlier part of his life Shakespeare wrote in a much easier style than later, and for this reason style as well as subject-matter should influence our choice. At the same time there should be no servitude to chronology, for children leave school too early for such considerations to be dominant. Many plays, both historical and comedies, are equally good in both ways. The following problem was placed before a large body of London teachers: Can we get, as it were, a certain sort of line of least resistance on which we may read Shakespeare's plays, taking them according to the suitability of their subject and style both together? For the primary school this test would leave about a dozen suitable plays—a wide choice. In the top part of the elementary school "Hamlet" and "Julius Cæsar" might be chosen. "Macbeth" is suitable in subject-matter, but difficult in style. "The Tempest" triumphs over its difficulties of style, which "The Winter's Tale" does not. "Coriolanus" would be omitted because of its style difficulties, whilst "Love's Labour's Lost" and the "Comedy of Errors" have been pronounced a stupid choice for children.

Authorities are by no means united as to the *method of teaching* to be adopted, and there is no doubt that any method will receive its chief value from the personality of the teacher. To the *younger children* stories should be told, the stories always being good literature; or the stories may be read by the child; or famous passages may be read aloud. Selected scenes might be presented to the children; first by the older scholars and then by the younger ones themselves. In this way a love for the subject

will be stimulated. This is the formal part of the work and probably needs the least teaching. With young pupils the more important and the more difficult part of Shakespeare is his ethical side. The æsthetic must wait on and grow out of the ethical. Hence the teacher will show that Shakespeare deals with a properly sane and reasonable world, and that his greatness lies in giving it a sane and reasonable interpretation. He will show the children that in Shakespeare you are dealing with ordinary human character, but raised to a higher plane because it is on the poetic side, and especially because it is on the dramatic side.

With the *older children* certain scenes and passages should still be selected, but in such a way as to interest the boy or girl in the play as a complete work of art. Passages should be committed to memory and the aid of reading aloud and recitation should be utilised. Reading aloud would be a great aid, especially as, unlike recitation, it does not imply memory. Good audible reading is an art and needs plenty of practice. "We are all poets," said Carlyle, "when we read a poem well." "'Tis the good reader makes the good book," says Emerson. "In the early days, before the invention of printing, the appeal of the poet was mainly to the ears of an audience, and even now for the purposes of education the appeal to the ear is the surest criterion of excellence in literary form." To the appeal to the ear, however, an appeal to the voice should be added; hence the importance of reading aloud.

The recitation lesson furnishes good opportunities for the study of literature. But verbal accuracy, although desirable, should not be pushed to extremes, or a distaste for the subject may be aroused and we have then paid too dear for our whistle. The true criterion of excellence in recitation is not verbal accuracy; it is sympathetic interpretation. It is audible evidence that the reciter has entered into the spirit of that which he recites. Hence the class should, as early as possible, be made to understand that correct manner and method are as important as correct text. For this purpose the teacher's task is demonstration rather than description.

Recitation should culminate in something like an annual festival—in this case, a Shakespeare day. Scenes should be acted periodically throughout the year, and for the annual festival

costumes should be utilised. In days of old scholars had to act plays annually, and some schools still follow this valuable practice, which furnishes means for training speech and memory, for exercising in the right form of address and for teaching boys and girls to hold their own in discourse. The imagination also would be cultivated; and as a further aid the characters of certain persons might be depicted by selected passages, and the children might be asked what side of the character was in each case set forth, or the converse method might be adopted.

There are several pitfalls which the teacher will have to avoid. *A rigid insistence upon verbal accuracy* in Recitation has already been mentioned, and *the selection of poetical passages for parsing and analysis* may be named as another. A poem is sometimes looked upon as a sort of quarry from which specimens are dug out for parsing and analysis. It is suggested that extracts selected for grammar exercises should as a rule be *prose* passages. Poetry should be kept for the admiration of the pupils; it should be used but sparingly for grammatical gymnastics.

Again, *too much explanation is often given and required*. The child is supposed to be able to explain every phrase and every word in the passage learned. All the meanings and allusions have to be known. Now we feel that much of our noblest poetry is grand, because there is something in it which we feel we cannot express. Explanation is necessary, but it should be kept within reasonable limits. We are cultivating the æsthetic sentiment when we get our children to *feel* beautiful thoughts, and less so, if at all, when we endeavour to get them to *explain* them. Everything should not be explained—something should be left to the imagination. If the child, in his own words, can give the general drift of the poem, that should be sufficient. Too often, to explain a passage too fully is to destroy all interest in it or to kill its beauty. The apotheosis of this rage for explanation is seen in too many of our annotated editions of the poets, in which the annotations frequently occupy more space than the text. If notes are used they should be a minimum. They should be those mainly which show the changes in the use of words, and these could be collected in a sort of glossary at the end. All other notes should come from the teacher, or from discussions on the meanings of passages. Finally, the notes should be suitable to the ability and attainments of the class.

The teacher will also need to be keen in perception, quick in sympathy, and tolerant in his views, so that he may avoid the error of *misdirected choice*. "What the child is capable of appreciating is often very different from what the teacher himself appreciates. The teacher's aim should be so to establish a mental background of appreciation in himself that he may insensibly influence in a similar manner the minds of those who are committed to his care.

The *time* to be devoted to the study will necessarily depend upon a number of factors; but speaking generally, it is suggested that for the first and second classes in the primary school, two lessons, at least, per week, each of forty minutes, plus ten minutes on two or three mornings, should be given to Repetition. The audible reading could go into the ordinary reading lessons, and the weekly essay into one of the composition lessons. The essay could be briefly discussed in one of the two formal lessons, but the distribution of the various branches of the subject within the allotted time will have to depend always upon the local and special circumstances of each school.

*Material aids*, such as pictures, picture galleries, museums, buildings, etc., should be enlisted. A good Shakesperian library should be bought and the reading of the books encouraged. Where possible, a "Shakespeare" garden might be cultivated, containing as many as possible of the trees, shrubs and wild flowers named by the poet. Lists of plants could be put up with names and suitable quotations affixed. Public parks, containing any of these specimens, and portions of the home gardens where allowed might also be utilised. In this way interest would be stimulated by vitalising the work, and the subject would be suitably co-ordinated with Nature Study. On proper occasions the theatre might be visited. It is said by some that the scenery and stage properties give a certain air of unreality in the reality, and that stage machinery may cripple imagination in some cases. But it is doubtful whether either of these charges is worth maintaining; it is far less doubtful that a good theatrical representation not only stimulates imagination, but also vivifies the subject with an intense interest.

**A Course of English Language and Literature.**—This course would be for senior scholars only; scholars between the ages of twelve and sixteen. The early part of the scheme alone

would therefore be available for most primary schools. Such a scheme would also presuppose some amount of previous instruction in the subject.

The time allotted to English, apart from Grammar, should not be less than three periods (of which one may be homework) each week; an additional school period is desirable for Grammar, though it is not essential that the grammatical teaching should be concentrated in a single period. The period will vary for different schools probably, thirty to forty-five minutes being the limit.

Texts taken from one author, or more than one, should be planned out for completion within each term; one text a term may usefully be taken, and each year should include both prose and verse. As to the order in which texts or authors should be taken, and as to length of text studied, no definite instructions can be given, since such order and length will of necessity vary with the stage of knowledge reached by the class, with the method of teaching adopted, and with the nature of the exercises set. Equal thoroughness of treatment need not, and indeed should not be given to all portions alike of the text studied; discrimination should be exercised as to which portions should be dealt with in detail, and which should be more lightly handled. The teacher should, therefore, carefully consider the text as a whole, and before the term begins should plan out, by weekly or monthly subdivisions, not necessarily of equal length, the work assigned for the term. Freedom and wide scope should be left to schools with regard both to texts and to methods of teaching. Elaborately annotated texts for the use of the scholars should be avoided.

As to the exercises connected with the text and subject-matter, it is recommended that, as far as possible, the exercises should be so arranged as to arise naturally out of the text, or be closely connected with it. This applies to each of the following exercises which may be suggested: (*a*) Repetition and reading aloud; (*b*) Meanings and use of words; (*c*) Analysis, including Parsing; (*d*) Paraphrase; (*e*) Abstract or Précis; (*f*) Composition or Essay. It need hardly be said that not all the exercises here suggested should be used in each month or even in each term; but each should be used from time to time.

Repetition exercises should not be required from scholars

whose verbal memories are exceptionally weak; for these some other exercise connected with the text should be substituted. Under the other headings sets of corrected exercises worked by the class should be kept for reference, and possibly for the Inspector's use. Model exercises under headings (*d*) and (*e*) should also be provided and kept for the same purpose.

## SUGGESTIONS FOR A FOUR YEAR COURSE IN ENGLISH.

The books given in the following scheme are merely by way of illustration. Each school should frame for itself in each year of the Course a list of suitable texts. The whole scheme as given here is that of the Board of Education.

Year of Course.	Age at Entry.	Texts : Poets.	Texts : Prose Authors.
I.	12-13	English ballads (early and modern). "Macaulay's Lays" (Roman and English). "Ancient Mariner." Longfellow (shorter poems) Cowper (shorter poems). Patriotic songs and lyrics.	"Robinson Crusoe." Stories of heroes (Greek, Roman, Scandinavian, Teutonic, Frankish, Arthurian). Tales from the "Faerie Queene". Gatty—"Parables from Nature".
II.	13-14	Longfellow (longer poems, e.g., "Evangeline"). Scott (e.g., "Lady of the Lake"). Patriotic poems (e.g., collections such as "Lyra Heroica").	"Pilgrim's Progress." Selections from "Don Quixote," Froissart, Malory, or "Gulliver's Travels". H. Kingsley—"Tales of Old Travel". Prescott—"Selections from Peru or Mexico". Scott (e.g., "Talisman," "Ivanhoe," "Quentin Durward"). Morris—"Story of the Glittering Plain".
III.	14-15	Simpler poems from one or more of the following: Milton, Gray, Wordsworth, Tennyson, Matthew Arnold; or from selections such as the "Golden Treasury". Shakespeare ("Julius Cæsar," "Merchant of Venice," "As You Like It"). Goldsmith ("Traveller" and "Deserted Village"). Morris (select stories from the "Earthly Paradise").	Macaulay—"Biographical Essays". Biographical sketches of great characters (e.g., Charlemagne, Alfred, Sir T. More, Queen Elizabeth, Raleigh, Cromwell, Frederick the Great, Dr. Johnson, Washington, Napoleon, Nelson). Voyages and travels (e.g., selections from Hakluyt, Purchas, Dampier, Anson, Cook). Scott (e.g., "Waverley," "The Antiquary," "Old Mortality").
IV.	15-16	More advanced poems, taken from Chaucer (Prologue), Shakespeare, Milton, Spenser, Pope, Wordsworth, Tennyson; or from collections such as the "Golden Treasury" (First or Second Series). Shakespeare (histories, comedies, or easier tragedies).	"Plutarch's Lives" (Langhorn). Kinglake—"Eöthen". Borrow (e.g., "Lavengro"). Modern prose comedies (e.g., Goldsmith or Sheridan). Selections from British essayists (e.g., Addison, Goldsmith, Lamb). Macaulay—Essays or selected chapters of the History. Froude—Selected short studies. Ruskin—"Sesame and Lilies".



## CHAPTER XV.

### ELEMENTARY SCIENCE.

#### **Difference between Object Lessons and Elementary Science.**

It is very difficult to differentiate between Object Lessons and Elementary Science. Some get out of the difficulty by linking the two subjects and treating them as one. Still, a little reflection will show sufficient difference to warrant distinct terminology.

Object Lessons.	Elementary Science.
1. Concerned mainly with <i>single</i> objects.	1. Concerned rather with <i>classes</i> of objects.
2. The object is considered as a whole; then the <i>parts</i> are examined. <i>Method mainly analytic.</i>	2. Concerns itself first with details; then with <i>wholes</i> ; proceeds from "particulars" to "generals". <i>Method mainly synthetic.</i>
3. Not specially concerned with generalisations.	3. Generalisations <i>the</i> object of Elementary Science.
4. Training the powers of observation dependent mainly on Observation, and in a less degree on Experiment, whilst Reasoning is subsidiary.	4. Observation mainly automatic. Experiment <i>the</i> feature of Elementary Science. Much Reasoning involved.

The difference between Object Lessons and Elementary Science is, however, mainly one of degree (see page 66). Many lessons are on the "borderland," and it is difficult to distinguish them either as Object Lessons or Elementary Science. Broadly it may be said that *Observation is the characteristic of Object Lessons, Experiment the characteristic of Elementary Science.* We will now compare and contrast Observation and Experiment.

#### **Observation in its relation to Experiment.**

##### **Examples:—**

- A teacher applies heat and converts water into steam.
- He takes a metal bar and shows that it gets longer on being heated, and that the more it is heated the longer it becomes.
- He gets his pupils to observe the clouds, and after lessons on Evaporation and Condensation, he leads his pupils to the theory of the formation of clouds.
- He gets them to examine the rocks in the locality, and after suitable illustrations and experiments, gets them to see that some were probably formed by the action of water, others by the action of heat.

All these would be exercises in Observation, but a brief examination will reveal some important differences in these various acts of observation.

In (a) he takes a cause (*heat*) and produces an effect (*steam*).

In (b) he takes a cause (*heat*), and by varying the degrees of the cause (*applying more or less heat*), he produces different effects (*varying lengths of the bar*).

In (c) he observes an effect (*clouds*), and from this effect he works backwards to the cause (*evaporation*, etc.). He is certain of both cause and effect, but he cannot control either.

In (d) he can observe an effect (*stratification*), and from that he can infer the cause (*action of water*), but he cannot be certain as to whether his supposed cause has really produced this special effect.

In (a) and (b).	In (c) and (d).
(1) He takes the cause and experiments for its effects.	(1) He observes the effects and infers the causes.
(2) He is an active observer.	(2) His mental state rather approaches a passive one.
(3) He experiments.	(3) He observes.
Hence, Experiment is that kind of experience in which we take causes and examine the effects which these causes produce.	Hence, Observation is that kind of experience in which we are able to note cause and effect, but are unable to influence either; or it is that kind of experience in which we are able to note the effect only.

Experiment is more potent as a knowledge-giving experience than observation. "We might have to wait years or centuries to meet accidentally with facts which we can readily produce at any moment in a laboratory" (Jevons).

### Sciences of Observation and Sciences of Experiment.

Such sciences as meteorology, geology, mineralogy, botany, are mainly sciences of observation. In them we deal mainly with effects; in some cases we do not even know the causes of the effects. Thus "male" and "female" are "effects" we meet with in botany and zoology; we know practically nothing of their causes. In some cases, as in meteorology, we know (or think we know) both cause and effect, but we cannot control either.

It should be noted that, within limits, some of the sciences mentioned above are experimental. When the botanist watches the effect of light, electricity, soil, etc., on the growth of plants, he is conducting experiments rather than making observations.

Such sciences as chemistry, magnetism, electricity, etc., are experimental sciences, because when we study them we can take causes and produce effects, and we can vary those causes and produce varying effects.

### Elementary Science and Attention.

Elementary Science is a fine aid for training the **Attention**, which has been defined as *the voluntary direction of the mind to any object which presents itself to it at the moment*. It implies **Interest**, and the chief factor in Interest is **Curiosity**. *Curiosity is the name given to that desire which the mind has of wishing to know the unknown*. It is "one of nature's provisions for extending our range of knowledge". It is to the mind what Appetite is to the body. Now it is the function of the teacher to arouse a reasonable curiosity, and his methods of teaching are all-important, e.g.:-

One teacher, wishing to teach that air presses upwards, tells the class the fact and then proceeds to illustrate it. Another commences by filling a tumbler with water, putting a piece of cardboard on top, and inverting the tumbler and card. The children will be filled with wonder that the water does not run

out, will be curious to know *why* it does not do so, and will speedily become interested in the lesson. The first teacher has stifled curiosity, and probably failed to arouse interest; the second teacher has stimulated curiosity, and interest follows in its train.

As Elementary Science is mainly concerned with Experiment and Reasoning, we proceed to discuss them in greater detail.

### **Practical Remarks on the Working of Experiments.**

#### **Before Lesson.**

1. Carefully rehearse the experiments beforehand. This will give certainty of manipulation, and economise time; *e.g.*, the teacher could arrange for the class to sketch the apparatus in their note-books while a liquid is being heated or cooled.
2. Have everything that will be required during the lesson to hand. There should be no running about during the lesson for bits of necessary apparatus.

#### **During Lesson.**

1. Point out the parts of the apparatus. Draw the whole or some special parts of the apparatus on the B.B. At some convenient time during the lesson the class should sketch the apparatus in their note-books.
2. Work each experiment step by step. Do not hurry and do not be nervous about the result. Nervousness is the result of insufficient preparation. Rehearsal gives confidence.

Sometimes, but very rarely, with all care possible, a failure ensues. Do not say "such and such should have been the result". Reserve the experiment to be worked next time.

3. Do not tell the class what to expect: draw attention to the main point of the experiment, and lead the observation of the class towards the result. *Try to make your class discoverers, not weary pilgrims along a beaten track.*
4. At the conclusion of the experiment question upon it, and *separate essentials from non-essentials.*

Too often a child mistakes means for ends, and attaches more importance to something incidental than essential. Thus in a lesson on *Hydrogen*, a pupil recollects the explosion, but forgets the main principle of the lesson—the combustibility of Hydrogen.

5. Write on the B.B. the great truth taught by the experiment.

### **General Remarks on the Working of Experiments.**

1. Do not work too many experiments. Too great a variety is confusing. So many things are seen that practically nothing is really seen at all. *Select typical experiments.* Others can be worked in the Laboratory.
2. Do not work a difficult, showy experiment where a simple one suffices. *The aim is not the experiment itself but the truth the experiment teaches.*
3. The simpler experiments should be repeated by the pupils in the Laboratory. Some experiments thus worked should, however, be somewhat different from those worked in the Lecture Room, in order to exercise the *ingenuity and reasoning power of the pupils.*
4. Note-books should be kept by the pupils and should be periodically and carefully examined by the teacher. They should not be mere transcription exercises: from some Text Book, but succinct accounts of what the pupils have themselves observed in the Lecture Room and Laboratory.

**Text Books**, improperly used, are often a hindrance to real progress, because they give the pupil second hand what he should acquire first hand. Some teachers allow the class to read the book, and then produce the specimen or perform the experiment to prove the facts stated. It has already been stated that this form of teaching stifles curiosity and cramps interest, and it may now be added that it also fails to give a full training in observation.

**ELEMENTARY SCIENCE AND REASONING.****Outlines of a Series of Lessons leading up to the Law****"Matter expands with Heat".****First Method:—**

1. Teacher obtains an iron ball which will just pass through a ring. He heats the iron ball and again places it on the ring. *It does not pass through.* **Inference: Heat caused the iron ball to expand.**
2. Experiment is repeated with brass, copper, leaden and glass balls. **Inference: All these bodies expand with heat.**
3. But iron, brass, copper, lead and glass are solids. **Further Inference: Solids expand with heat.**
4. Teacher takes a flask filled with water, and provided with a well-fitting cork, through which runs a narrow tube. The class notes the level of the water in the tube. The water is heated. *The water rises in the tube.* **Inference: Water expands with heat.**
5. The experiment is repeated with alcohol, milk, treacle, etc. **Inference: Alcohol, milk, etc., expand with heat.**
6. But alcohol, milk, etc., are liquids. **Further Inference: Liquids expand with heat.**
7. Teacher partly fills a bladder with air, ties up the opening, draws attention to the wrinkled surface, and places the bladder before the fire. *The wrinkles disappear, showing that the bladder is now full of air.* **Inference: Air expands with heat.**
8. The experiment is repeated with coal gas and carbonic acid gas. **Inference: These two gases expand with heat.**
9. But air, coal gas, etc., are all gases. **Further Inference: Gases expand with heat.**
10. But solids, liquids and gases are forms of matter. **Final Inference: Matter expands with heat.**

**Second Method:—**

1. The teacher enunciates the principle: **Matter expands with heat.**
2. He argues that solids are a form of matter; iron is a solid; therefore **Iron expands with heat.**
3. He then proceeds to work an experiment to prove his assertion.
4. He deals with liquids and gases in a similar manner.

**Chief difference between these two Methods.**

First Method.	Second Method.
Particulars (i.e., single cases) were dealt with, and from these particular cases general laws were inferred. This method of reasoning is known as <b>Induction</b> .	The general law was first enunciated, and particular cases were then shown to be examples of this general law. This method of reasoning is known as <b>Deduction</b> .
Induction.	Deduction.
<ol style="list-style-type: none"> <li>1. Is the method of <i>education</i>.</li> <li>2. <i>Is slow</i>. All knowledge has to be acquired first hand by the observation of particular cases.</li> <li>3. <i>Is a natural method</i>. The child begins with the consideration of individual cases and afterwards proceeds to the consideration of classes.</li> <li>4. <i>Is a sure method of education</i>. The general law is gradually approached. Its meaning is well grasped, and it can then be accurately applied to new cases.</li> <li>5. <i>Is a method which fosters self-reliance in children</i>. By it they are led to depend on their own acts of perceiving, conceiving and judging.</li> </ol>	<ol style="list-style-type: none"> <li>1. Is the method of <i>instruction</i>.</li> <li>2. <i>Is quicker</i>. The child avails himself of knowledge others have acquired.</li> <li>3. <i>Is not a natural method</i>. Theories are put before facts.</li> <li>4. <i>Is not a sure method</i>. Many general laws are too difficult for children to understand when presented to them by this method. The children have learnt the words but they may not have grasped the ideas; hence there is faulty application to new cases.</li> <li>5. <i>Is a method which encourages dependence on others</i>.</li> </ol>

The skilful teacher will use either method as occasion may demand. Many lessons require the application of both.

**ANALOGY.**

A teacher puts some small stones, sand and fine earth into a strong glass bowl partly filled with water. He stirs up the mixture, and on ceasing to stir gets the class to notice:—

1. That the stones are deposited while the water is moving rapidly;
2. That the sand is next deposited as the water slows down;
3. That the fine earth is deposited when the water is still.

He shows:—

1. That conglomerate is largely composed of stones;
2. That sandstone is composed of sand;
3. That shale is hardened mud.

He then leads the class to reason:—

1. That conglomerate is evidence of the former existence of rapidly running water;
2. That sandstone points to slowly moving water;
3. That shale points to still water.

The reasoning in the above example is different from either Inductive or Deductive reasoning. Certain similarities have been discovered between the sandstone and the sand, and what is true of the sand is believed to be true of the sandstone. If the points of resemblance are few, the reasoning might be false; if the points of resemblance are many, the reasoning is probably true. The certainty of the process depends on the extent and number of the resemblances.

This kind of reasoning is called Reasoning by Analogy, and is thus described by Mill: "Two things resemble one another in one or more respects; a certain proposition is true of one, therefore it is true of the other".

**Elementary Science and Classification.**

Inductive Reasoning, Deductive Reasoning and Analogy are concerned in each case with the detection of resemblances amidst differences, and thus lead to Classification.

Elementary science demands a knowledge of the simple principles of classification; and classification has been defined as the arrangement of things, or our notion of them according to their resemblances or identities.

It is one of the most constant occupations of the mind. Things are good or bad, old or new, nice or nasty, etc., to us from our earliest memories. The teacher's aim then is to utilise this habit, and direct it into the channel of intellectual work. "The *object* of a classification is the best possible ordering of our ideas in reference to things; or to make us think of those objects together which have the greatest number of important common properties. Its *general problem* is to provide that the things be thought of in such groups, and these groups in such an order as will best conduce to the ascertainment and remembrance of their laws" (Mill). By it we seek to reduce multiplicity to unity: and

thus, when we know an object belongs to a certain class, we can infer of all the other members of that class the properties which we know to belong to this particular object.

It will thus be seen that classification is a great economical force, reducing the labour of memory, and bringing a mass of knowledge within our grasp by rendering it easier of acquirement. It naturally follows on *abstraction*, for we cannot form a class until we have abstracted the common qualities of that class. The process of classifying is as follows:—

1. Look for a *type*; *i.e.*, ascertain what classes of objects possess a general resemblance to each other.
2. Then determine what *characters* these resembling objects have in common.
3. Then constitute your *class* by means of some of these resemblances.

Take as an example the sub-kingdom of flowering plants. They possess a general resemblance (flowering), and so give us our type. We find on examination that these resembling objects have certain characters in common; *e.g.* :—

Dicotyledons.	Monocotyledons.
<ol style="list-style-type: none"> <li>1. Embryo with two cotyledons.</li> <li>2. Primary root growth exorhizal.</li> <li>3. Growth of wood with open bundles, exogenous.</li> <li>4. Leaves net veined.</li> <li>5. Parts of a flower arranged, as a rule, in fours or fives.</li> </ol>	<ol style="list-style-type: none"> <li>1. Embryo with one cotyledon.</li> <li>2. Primary root growth endorhizal.</li> <li>3. Growth of wood with closed bundles, endogenous.</li> <li>4. Leaves parallel veined.</li> <li>5. Parts of flowers arranged in threes.</li> </ol>

Out of these resembling characters we constitute our class dicotyledon or monocotyledon.

### Sciences best adapted for Young Scholars.

#### 1. Elementary Physics and Elementary Chemistry.

These sciences furnish a large number of experiments easily worked and capable of giving exact results. They do not require elaborate apparatus, and the truths taught are well within the compass of the average scholar.

#### 2. Elementary Botany.

This subject has much to commend it. It furnishes ample scope for training in observation and in power of description. It inculcates a love of nature, and requires very little expensive apparatus for its successful teaching.

### Elementary Science and Training.

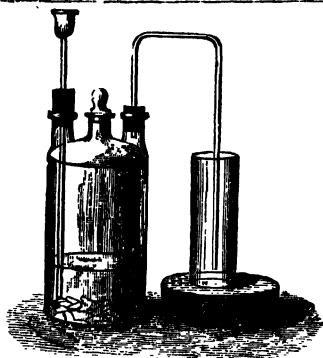
The advantages accruing from a study of Elementary Science will suggest themselves after a perusal of this chapter, but it may lay special claim to affording a training in *exactitude*. The accuracy of observation, the careful manipulation of apparatus, the clearness of definition and the accuracy of the mathematical calculations involved, all tend to form a habit of exactitude—a valuable habit for the real business of life when school days are over.

An illustrative lesson in Elementary Science suitable for Standard III. is now given.

### CARBONIC ACID GAS.

*Things required*—A pickle-jar with cork fitted with a thistle funnel and bent tube (a more elaborate form of the apparatus is shown in fig. below); chalk; any acid (vinegar will do); water, several glass jars, quicklime, candle mounted on wire, scales, spirit lamp, saucer.

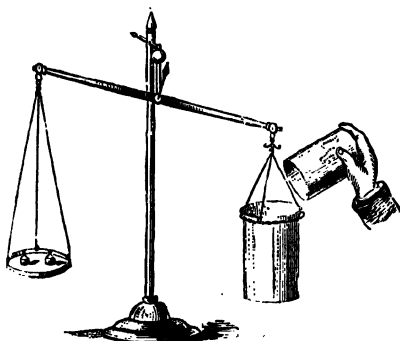
Observations and Experiments.	Results	Inferences.
I. (a) Place chalk in saucer : pour a few drops of acid on it. (b) Pour a few drops of acid on quicklime.	Bubbles are formed on the chalk. No bubbles are formed.	<b>The bubbles must be gas.</b> <b>This gas must have been driven off when the chalk was turned into quicklime.</b>



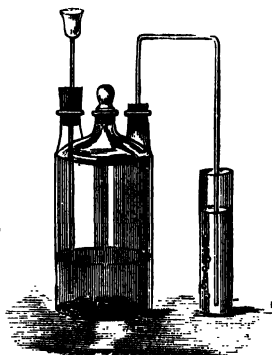
Apparatus for the preparation and collection of carbonic acid gas.

2. (a) Place piece of chalk in glass jar ; lower lighted candle into jar. (b) Pour acid over chalk ; lower lighted candle. (c) Again lower lighted candle, and note if the new gas burns. (Teach the name Carbonic Acid Gas.)	The candle continues to burn. The candle is extinguished. The new gas does not burn.	<b>The gas given off is not air, for the candle will not burn in it ; it is not coal-gas, for it does not take fire.</b>
3. Fit up apparatus described in "Things required" (fig. above shows a more elaborate form) ; before corking the bottle insert some chalk ; pour <i>dilute</i> acid through the funnel.	Bubbles are formed.	<b>Carbonic acid gas is being produced.</b>
4. Lower lighted candle into the glass receiver.	The candle is extinguished.	<b>The receiver must contain carbonic acid gas.</b>

Observations and Experiments.	Results.	Inferences.
5. (a) Ask children if they can see the gas in the receiver; compare with air and coal-gas. (b) Let child <i>smell</i> the jar; compare with air, contrast with coal-gas.	The carbonic acid gas is invisible. The carbonic acid gas has no smell.	<b>Carbonic acid gas, like air and coal-gas, is invisible.</b> <b>Carbonic acid gas, like air, and unlike coal-gas, has no smell.</b>



Illustrating the density of carbonic acid gas.



Showing how a solution of carbonic acid gas may be prepared.

6. (a) Take jar (1), filled with carbonic acid gas. Test jar (2) with lighted candle to show that it contains no carbonic acid gas. Pour carbonic acid from jar (1) to jar (2) in the same way as water would be poured; again test jars; Or (b) Fit up the apparatus shown in left-hand fig.; balance the open glass vessel; pour in carbonic acid gas.	Jar (2) now contains carbonic acid gas; jar (1) has no carbonic acid gas. The side containing the carbonic acid gas descends.	<b>Carbonic acid gas must be heavier than air, for it can be poured downwards.</b> <b>Carbonic acid gas is heavier than air.</b>
7. (a) Allow carbonic acid gas to bubble into water (see right-hand fig.) for some time. (b) Take the water used in (a), and gently heat it in a long glass vessel. (c) Lower lighted candle into the vessel; do not allow it to touch the liquid.	The candle is extinguished.	<b>Carbonic acid gas is soluble in water.</b> <b>The carbonic acid gas may be obtained from the water by heating it.</b>

### B.B. SKETCH.

#### Carbonic Acid Gas.

**Invisible.**  
**No taste, no smell.**  
**Does not burn.**

**Puts out candle.**  
**Heavier than air.**  
**Soluble in water,**



## CHAPTER XVI.

## MUSIC.

**ITS VALUE IN SCHOOLS.**

**1. Pleasure.**—The primary objects of school music should be for pastime and pleasure. It is perhaps the most exceptional as well as the cheapest of human pleasures. It is undoubtedly a substantive contribution to the enjoyment of life. "Of all the fine arts, the most available, universal, and influential is music" (Bain).

**2. Physical Advantages.**—It opens the lungs and aids circulation. It is stimulating in drill and marching.

**3. Discipline.**—The consensus of will, when all unite in some beautiful song, is of great value to discipline. The scholar becomes a unit in a body more or less large, where he has to submit entirely to the rule and guidance of the conductor.

**4. Ethical Advantages.**—Some forms of music educe the moral virtues and the nobler characteristics of the mind. A musical strain exerts, oftentimes, an immense power over the mind to animate, to encourage, to soothe, and to control. Some, however, deny that it has any permanent moral influence. There are, moreover, certain quasi-spiritual relations in singing which we do not yet understand fully.

**5. Patriotism.**—"One of the chief means of diffusing through the people natural sentiments, is afforded by school songs, which embody and express the hopes of industry, and the comforts and contentment of household life; and, preserving for the peasant the traditions of his country's triumphs, inspire in him confidence in her greatness and strength. The national legend, frequently embodied in songs, is the peasants' chief source of that national feeling which other ranks derive from a more extensive acquaintance with history. The songs of any people may be regarded as

important means of forming an industrious, brave, loyal, and religious working class."

**ITS AIM.**—The aims of school music are largely suggested by its value, and the items of value have just been enumerated. But more particularly its aims may be briefly enumerated as follows:—

1. To teach to sing by ear and note. To train the ear and voice so as to give power to appreciate and perform music.
2. To enable a pupil to leave school capable of reading and understanding popular music, both sacred and secular.
3. To train in sacred music for public worship.
4. Music is an innocent recreation. An early taste for music may exert a beneficial influence upon the choice and character of the amusements of the people.
5. To cultivate patriotism, industry, loyalty, and religion.

**CLASSIFICATION.**—This will vary in different schools, and must depend on—

1. The size of the school.
2. The arrangement of the rooms.
3. The number of the qualified teachers upon the staff.
4. The length of the school life.

For ordinary schools four divisions are suggested; but for smaller schools fewer divisions will be necessary, and the work must be graded to suit. This grading will be a fluctuating quantity, and will largely depend upon the organising ability of the teacher.

Division I. for Infants.

„ II. „ Standards I. and II.

„ III. „ „ III. and IV.

„ IV. „ „ V. and upwards.

In smaller schools with fewer divisions less should be attempted than in larger schools. The range of instruction must be restricted, or more work is thrown upon teachers and scholars just where circumstances are least favourable for any increase of burdens.

### The Two Notations Compared.

Tonic Sol-Fah.	Old Notation.
<ol style="list-style-type: none"> <li>1. "It combines scientific accuracy with modes of expression the most direct and simple."</li> <li>2. It is quicker and easier, and therefore more suited to children.</li> <li>3. It is the notation generally used in our primary schools.</li> </ol>	<ol style="list-style-type: none"> <li>1. It is scientific, graphic, and universal, whilst tonic sol-fah is local.</li> <li>2. It is suited to instrumental music. Tonic sol-fah is not used, except in rare cases, for this purpose.</li> <li>3. It is the recognised music language of the civilised world.</li> </ol>

THE TWO NOTATIONS COMPARED—*continued.*

Tonic Sol-Fah	Old Notation.
<p>4. Its time names and its system of spacing by continuation lines make the teaching of time easier and more thorough.</p> <p>5. Modulator advantages:—</p> <p>(a) Difficulties can be presented singly.</p> <p>(b) Attention can be paid to particular difficulties.</p> <p>(c) Attention of a whole class can be obtained.</p> <p>(d) Mental effects can be illustrated.</p> <p>6. It is a splendid aid to the old notation, and a stepping stone</p> <p>7. The perpendicular modulator is an advantage, because it pictorially represents the higher and lower notes of the scale.</p>	<p>4. It is the medium of expression used by the world's greatest masters, and their works are written and preserved in it.</p> <p>5. "It can claim all the modulator advantages of the other notation, and something more; for having once conquered the modulator, the end is attained; whilst the tonic sol-fah disciple has to attack the old notation without a modulator to assist him."</p> <p>6. In old notation the staff is really the modulator, and on it are pictorially represented musical intervals, whilst in tonic sol-fah the modulator is at right angles to the notation.</p> <p>7. Most students who continue their musical studies ultimately revert to it.</p>

**VOICE TRAINING.**

**1. Tone.**—The teacher should aim to get a soft, clear, round, sweet, and yet full quality of tone.

The voices should blend. Generally, individual voices should not be distinguishable at a short distance. For this purpose it is best to cultivate a medium strength of tone, or the singing will inevitably be flat. With moderately soft singing it is also often flat, hence the range and key should be suitable. The range should be small at first, and should be gradually extended. Each note should be brightly and clearly attacked, and there should be no sliding or slurring allowed. Cultivate downwards. It is urged by eminent authorities that "in this way the sweetness of soft high notes can be best imparted to the whole voice; whereas, if the upward moving exercises are always used, the tendency is to use the thicker and heavier tone on the high notes". Hence the teacher will train in scale exercises from *doh*<sup>1</sup> to *doh*, and not conversely, as a rule.

**2. Breath.**—The breath should be thrown well forward upon the front palate, and immediately behind the roots of the upper teeth.

Breathing exercises without singing are very essential, as either too little or too much impairs the quality of the singing. There should be exercises in inspiration, expiration, and retention or holding of the breath. This should be done at the teacher's dictation. The pupils should keep their mouths shut in these exercises. Odd minutes may be used in this way, and when standing the class should be trained to take a series of breaths without moving the shoulders. The inspiration should be deep; the expiration slow and gradual. Pupils should never breathe in the middle of a word, or between words closely connected in sense, or anywhere where it is likely to spoil the continuity of the words, or the flow of music.

**3. Articulation.**—The articulation should be clear and distinct.

Bad articulation is one of the greatest faults of singers, especially amateurs. It is often impossible to recognise many of the words sung, and others are only recognised by the aid of the context. The sense of the words must be properly rendered by distinct articulation and proper expression. The reading lessons

can be turned to account here, for a satisfactory spoken articulation is a good stepping stone to a musical one. The shape of the mouth, and the proper rendering of the vowels, will be the chief points requiring attention. Certain vowels, like *a* (father), *ā* (fate), *oa* (wood), and *oo* are "forward" vowels, and should be sung well forward in the mouth; *e* is difficult, and requires a clear parting of the lips.

#### 4. Practice.—Voice exercises should be given.

The practices should not be too long. Little and often is best. For musical purposes children's voices soon tire. The aim of the practices will be to produce a good quality and to maintain it. For this purpose it will be again necessary to remind the teacher that the exercises should be carefully chosen as to range and key, and graded to suit the varying vocal endowments of the children.

**5. Posture.**—The attitude of the children must receive close and constant attention. There can be no good production if associated with unnatural or unsuitable methods.

The children should stand to sing; upright, with heads erect, shoulders well back, and the chest well forward. These positions must be easy and natural. It is a good practice to go through a little chest drill before beginning the singing. Practices like some of those used in dumb-bell exercises are best; these get the shoulders back and expand the chest. They must be taken moderately, or the breath will be impaired in some cases.

### THE COMMON SCALE.

**I. The Starting Point.**—Explain the meaning of scale, and illustrate from both notations. Then choose any tone. This is the starting point; the key tone or tonic. Call it *doh*.

Make the class understand that of themselves different notes possess no peculiar property or tone character—nothing more than variation in pitch. But thoroughly impress a given sound on the ear, and all others will bear a proper relation to, and will circle round it. The note to be impressed is the tonic. The other notes of the scale then take up certain definite relations to it. This will be illustrated by the mental effects of the notes of the scale.

**II. Mental Effects.**—These must be gradually *felt* by the class. *Contrast* and plenty of *repetition* will be the aids to apply.

1. Teach the fifth (*soh*). The class notes its effect, but the teacher need not yet name it. Practise in various keys.
2. Teach the third (*me*). Proceed as with the fifth.
3. Then combine exercises on the *tonic*, the *fifth* and the *third* in different keys; *i.e.*, practise the class in the *doh* chord (d-m-s). The notes harmonise. There is tonic sympathy, and the chord gives conclusive satisfaction.
4. The tonic should then be taken with the second, fourth, sixth, and seventh notes of the scale. The class now feels the effects of tonic contrast. The notes do not harmonise, but dissonate. Each interval creates a want.
5. The class should now be ready to contrast and name the mental effects of the scale. Each in its turn should be contrasted with the tonic and with the others. The teacher will then be able gradually to fill in the effects against each note as he writes it on the B.B., thus:—

DOH—Strong or firm tone (octave)

TE—Piercing or sensitive tone.

LAH—Sad or weeping tone.  
 SOH—Grand or bright tone.  
 FAH—Desolate or awe-inspiring tone.  
 ME—Steady or calm tone.  
 RAY—Rousing or hopeful tone.  
 DOH—Strong or firm tone.

The children do not grasp these differences at once. Plenty of repetition and illustration will be required. Subsequently the teacher will show that all these effects are modified by pitch, harmony, quality of tone, and rate of movement. These differences or modifications must be practically demonstrated, and then the attention of the class must be fixed by the application of contrast.

### THE MODULATOR.

The modulator should not be used until the major scale is impressed on the ear. This scale and its mental effects will be taught by ear. Every lesson then contains some modulator practice. The teacher should point the modulator, and the class should sing *without* pattern after the initial lessons. The pupils should be taught to sustain each note as long as the pointer is kept upon it. The wall charts and sheets should be used for exercises. The key tone should always be pitched well within the range of the class voices, and the melody should be sung in tune. The intervals should be carefully graded according to the requirements of each division. There should be no random pointing by the teacher. The class should sometimes sing in sections, and the teacher will then be able to discover where the weakness and strength of his class respectively lie. *Sol-fah-ing* should always be followed by *laa-ing*, and in later lessons the pupils should sing to *lah* always, only falling back on the *sol-fah* names for corrections. Transitions should be carefully introduced, the removes appearing in their proper order.

### Early Lessons in Tune.

1. Explain pitch and key tone.
2. **Pattern Singing and Class Imitation.** The teacher gives some pattern singing; the class listens, and then repeats the tones sung by the teacher. The teacher should not sing *with* the pupils, but proceed as follows:—
  - (a) The teacher sings a tone to *lah*. The class imitates. The teacher tells them that is their *key tone*.
  - (b) The teacher sings this tone and the fifth (*soh*). The class imitates.
3. **Key Change and Self-Effort.** The teacher gives *another* key tone. The class sings it and tries to give the *soh*. The teacher practises this interval by frequently changing the key. The dominant range (♮ to ♯<sup>1</sup>) must be systematically studied, because the mental effects of the scale tones are somewhat modified by the prominence given to the fifth of the key. The class must not be practised too exclusively in low keys, because, then, children often fail when asked to sing in a higher key.

4. **Introduce the Mediant.** The teacher sings *me*. Then there is pattern singing, imitation, self-effort, and practice in various keys; *e.g.*, *d, m, s, m, s, d, s, m, s, d*.
5. **Introduce the Octave.** The exercises can now be increased in variety.
6. **Manual Signs.** These should be used. They introduce variety, help the mental effects by association, often save time, and demand close attention. In Division II. no leaps should be made to or from the second, fourth, sixth and seventh notes; *i.e.*, tonic contrasts should be avoided. In Division III. any intervals may be given, hence the teacher should become proficient in the ready production of manual signs.

### HOW TO ARRANGE A SCHOOL MUSIC CLASS.

For systematic instruction in singing, Mr. John Evans makes some very practical suggestions. He recommends that you should **sort your pupils**, to make it possible for all to learn quickly and pleasantly; *i.e.*, you should arrange your pupils according to their natural musical ability. He further recommends that you should place the most promising at the back of the class, and the least promising in front near the teacher, and he points out certain *advantages for this arrangement*.

1. The teacher gets the *result* he wants with less friction and labour.
2. It gives the teacher the opportunity of *rewarding* those that make most progress by giving them a place with the selected voices.
3. *Pure intonation*, which is the chief thing to be worked for, will be obtained more quickly and easily.
4. It affords great help in *voice training*, as the best voices serve as models for the others, and give the tone required, especially in classes where the teachers cannot pattern the tone they want.
5. It materially *helps to cure flat singing*, for the flat singers are placed in front, where the other singers hear less of them.

#### How to Find the most Promising Voices.

1. For Standards I. and II. the teacher stands in front of the class and calls on ten or twelve to listen to him whilst he sings the following phrase:—

Key G. *m, d, s, l, s.*

2. The children imitate, and the sweeter and purer voices are easily detected and placed.
3. Then try the whole class in the same way.
4. In Standard III., instead of testing by imitation, a suitable exercise should be written on the B.B.; or the teacher may dictate a phrase.
5. The altos should be tested by themselves.

### EAR TRAINING.

No branch of school music is so difficult to teach as this, for the subject is inherently difficult. But any lack of endowment on the part of the pupils can be more or less successfully met by carefully graded teaching; and some useful suggestions for this purpose were set forth in one of the early numbers of the *School Music Review*, the chief points of which are embodied in the following hints:—

## I. Requirements for Success.

1. **Capacity.**—The teacher must be capable. He must have a cultivated ear himself, and, unless he has an instrument, he must be able to sing in tune. His enunciation must also be good, his vowel pronunciation being correct.

2. **Time.**—Some part of each lesson must be set aside for training the ear. About one-fifth is generally recommended.

3. **Gradation.**—The exercises must be carefully prepared and graded.

4. **Variety.**—The exercises should also be varied.

5. **Suitability.**—They must be adapted to the ability of the class.

6. **Classification.**—The pupils should be classified, because ability varies, and the classification should be carried on to the limits of the staff. A good classification acts as a powerful stimulus.

## II. Its Stages.—There are practically three stages.

### A. Imitation.

1. If possible, a musical instrument should be used, at least as a change. The voice may be used later if the teacher is thoroughly capable, but he should begin with the instrument for the following reasons:—

- (a) It is safer.
- (b) It is easier.
- (c) The pitch can be varied.
- (d) It prevents the class getting too used to one voice.
- (e) It removes the vowel difficulty.

2. The imitation proceeds as follows:—

The teacher sings a few notes.

The class imitates.

The teacher *laas* the same notes.

The class again imitates.

The teacher then graduates his exercises somewhat as follows, and this introduces the second stage—discrimination.

### B. Discrimination.

1. The pupils tell—

- (a) Any arrangement of a three-tone key chord, as *d, s, m*, or C, G, F.
- (b) The same, without the first note being told.
- (c) Any arrangement of a four-tone key chord, as *d, s, m, d'*, or C, G, E, C', the first note being told.
- (d) The same, without any note being told.
- (e) Alternatives. The teacher sings.

<i>s, t, d'</i> G, B, C'	<i>s, l, s</i> G, A, G
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And then asks which he sings; *i.e.*, the class discriminates.

(f) Any three tones commencing on some tone of the key or *doh* chord.

2. There must be plenty of practice to *laa*.

Do not begin too soon. Wait till the pupils can command a fair amount of ability in sight singing, whilst using the *sol fa* syllabus. Otherwise there is guessing, or a following of a few leaders. Again, do not trust too much to the value of collective *laa*-ing, for the weak are too much at the mercy of the strong. Individual work must supplement.

C. **Dictation.**—The three stages, imitation, discrimination, and dictation, will now proceed together, affording mutual assistance. Collective *laa*-ing exercises will still be necessary, but they must be well graded, and not too abundant as they are fatiguing. *Manual signs* should be used in all the stages, for in addition to introducing variety, they fix the attention and strengthen the power of concentration; they have been already shown to have a valuable connection with the mental effects, and they act as a fine substitute for the modulator, and so train for sight singing at the same time. Furthermore, they are an aid to discipline, as they allow the teacher to exercise greater vigilance over the class, and they make the work more thorough by enabling the teacher to detect the lazy, timid, and indifferent.

### III. Teaching.

1. **Give laa-ing Exercises.**—Some such scheme as the following is suggested:—

- The teacher sol-fahs easy phrases, and the class repeats, singing to lah.
- The teacher dictates short easy phrases, and the class sings them (1) to sol-fah syllables, (2) to lah.
- The teacher dictates and directs. The class sings up or down the scale, repeating one tone or omitting as directed.
- The class sings one stated tone of the scale to lah. The teacher sol-fahs other tones, and the class tries to repeat the first stated tone.
- The class sings a phrase. The teacher sol-fahs another phrase, and the class tries to repeat the first phrase.
- The teacher writes a timeless exercise on the B.B., points to it very slowly, making a pause of a second or two between each two tones; and the class has to think of the next tone before it is pointed to—a very valuable collective exercise.
- The class sings to lah a very short easy phrase, and it then makes varied additions to the phrase as dictated by the teacher.

2. **Give easy Ear Exercises.**—In giving these, and in testing, observe the following rules:—

- Sing each ear test twice before proceeding to the next.
- Change the key, so that no two consecutive tests are in the same key.
- Sing the *doh* chord to lah slowly before each test; and again in the same key before the second test.

3. **Mental Effects of Scale Tones.**—When a fair power of observation is gained, the peculiar effect tones of the scale have upon one another can be used. The mental effect of a tone is roughly the sum of its relations to all the other tones of the scale. *Verbal explanation is not much good; mental effects must be felt, not understood.* They must be repeatedly and pointedly demonstrated, and then the sol-fah syllable truly becomes the name of a tone, the name of a sensation. Close attention is necessary. To get this let the whole class sing the chord, and then let one of the class sing the tone.

4. **Graduation.**—Give a graduated course of moderate difficulty. The teacher will write something like the following on the B.B., and the class will have to discover what tones are sung at the blanks. Fewer tones should be given as the class progresses.

1	2	3	4	5	6	7	8	9	10
d	s		r	l	s				d
C	G		D	A	G				C

5. **Accumulating Exercises.**—These cultivate a keen observation and a good memory for tune.

- The teacher sings a short and perfectly easy phrase; e.g., d, r, m.
- The class answers correctly.
- The teacher sings the same phrase and adds two notes.
- The class again answers correctly.
- The teacher then adds two more notes, never adding until the previous phrase is correctly recognised.

6. **Written Exercises.**—These are very valuable exercises. Slates or paper can be used, but paper is best for obvious reasons. The teacher writes



down a number of tones to be used in each line, numbers, and properly spaces them. (He should explain the whole plan of the exercise.) If the test occupies, say, four lines, like a hymn tune, two or three notes should be given in each line.

	1	2	3	4	5	6
First Line - - - - -	d C			fah F		
Second Line - - - - -		r D	d C			r D
Third Line - - - - -			l A	s G		m E
Fourth Line - - - - -		s G		m E	r D	d C

### TIME AND TUNE COMBINED.

Exercises combining time and tune are now required in the higher divisions, but it is not wise to wait till those divisions are reached before any attempt is made to combine the two in teaching. Children must be taught to read at sight, if their knowledge is to become power. The work must be graded and well arranged, so that the difficulties may be gradually approached.

1. **Grade your Exercises.**—The *School Music Review* recommends:—

- Choose those containing easy intervals. Exercises with repeated notes are generally easy, because they allow the attention to be largely directed to the time.
- Intervals in the key chord or doh chord are easy.
- Passages that creep from note to note, as it were, are easy when compared with passages containing free leaps.
- Short continuations are generally difficult. The rhythm may be difficult quite apart from the intervals.
- Rests, preceded by a continuation, often give trouble.

The following are given as illustrative examples:—

KEY F.

$$(a) \quad \left\{ \begin{array}{l} d : d.d | d : m | s.s : s.s | s : -- \end{array} \right\} \parallel$$

KEY G.

$$(b) \quad 1. \quad \left\{ \begin{array}{l} d : s | m : s_1 | d.s_1 : m.d | s : -- | s.d m.s_1 | d.m : s_1.s \end{array} \right\} \\ \left\{ \begin{array}{l} f : m.r | d : -- \end{array} \right\} \parallel$$

KEY G.

$$2. \quad \left\{ \begin{array}{l} t_1 : f | r : f_1 | r.l_1 : f.r | l : -- | l.r : f.l_1 | r.f : l_1 \end{array} \right\} \\ \left\{ \begin{array}{l} t_1 : s | d : -- \end{array} \right\} \parallel$$

## KEY C.

- (c)  $\left\{ \begin{array}{l} | d : r | n.f : | l : s | s.f : m | m \quad f.s | l.s . d | \end{array} \right\}$   
 $\left\{ \begin{array}{l} | t : l.t | d : - \parallel \end{array} \right\}$

## KEY G.

- (d)  $\left\{ \begin{array}{l} | d : - . d | r : - . r | m : - . d | d : s \parallel \end{array} \right\}$

## KEY F.

- (e)  $\left\{ \begin{array}{l} | m : - | f : r | r : - | - : | s : - | - : f \end{array} \right\}$   
 $\left\{ \begin{array}{l} | m : - | - : | r : - | d : - \parallel \end{array} \right\}$

It will be observed that two exercises are given under *b*. These show that it is not always the mere width of a leap that determines the difficulty; the particular members of the scale employed must be considered. The first passage is quite easy, whilst the second, although using much the same interval movement, is very much more difficult.

## 2. Preparatory Exercises.

(a) Choose your exercise carefully.

(b) Time it to the *time names*.

(c) Time it to *lah*.

(d) Sing it to the *sol-fah names*.

(e) Sing it to *lah*.

(f) Sing it, with *time and tune combined*, to the *sol-fah names*.

(g) Sing it, with *time and tune combined*, to *lah*.

(h) If there are any words, *sing to the words*.

(i) Finally, sing with due regard for the expression marks.

3. **Sight Exercises.**—Here the piece should be *laid* to time and tune at once, and then sung to the words with due expression.

4. **Final Stage.**—The piece should be taken straight off, with proper attention to the conductor. This is a difficult accomplishment, involving a rapidly shifting attention, and marking a high state of perfection. It is the final goal of all school musical effort, and must not be sought too hurriedly. Every previous step will require complete mastery before any efforts of this nature are attempted.

## TIME.

**How to Give the Idea of Time.**—Appeal to the common *experience* of the children. They walk or run the same distance in unequal times; one cart goes faster than another; one train slower than another; and so lead the children to see that one sound follows another sometimes at regular intervals, sometimes at irregular intervals. Demonstrate this before the class. It will be observed that sometimes the sounds are quick; sometimes slow. Show this on some musical instrument, on some common

object, or by the voice. If the sounds follow each other in an orderly succession the effect is called **time**.

**To Teach Accent.**—Teach by talking and singing.

1. **Talking.**—The value of accent can easily be made apparent by ordinary speech. Repeat some *verbal* phrase in a *monotone*. Then repeat the same phrase in ordinary conversational style. The difference will be obvious to the children. That difference is made by *accent*. Illustrate further by single words. The accented syllable should be slightly exaggerated. *Verbal illustrations* should be given and asked for, and from these it will be noticed that in every word there is at least *one* strong accent; e.g. —

beau'-ti-ful equals *strong, weak, medium*.

di-ges'-tion „ *weak, strong, weak*.

good'-ness „ *strong, weak*.

2. **Singing.**—Now sing a simple phrase in a monotone, making the notes of equal length and strength. Then repeat the phrase again with its proper accents. The difference will again be obvious, and it is again caused by *accent*. Now ask the class to say what accent is. They will tell you that some words are louder than others, or that one is more abrupt than the other. *Illustrations* should then be given from the tonic sol-fah or old notation—whichever may be taught in the school.

**The Time Chart.**—The teacher is not advised to introduce the chart *en masse* to the pupils. He will find it better to print that portion which he wishes to use upon the B.B. The whole chart is distracting to the attention of the ordinary scholar, and apt to intimidate the dull and weak. The lessons should be introduced as required, and little passages written on the B.B. to illustrate them. The lessons should fall at least into six classes, some of which will be introduced to the higher divisions only. The classes should be arranged as follows:—

Class 1. Wholes and halves.	Class 4. Sixths.
„ 2. Quarters.	„ 5. Eighths.
„ 3. Thirds.	„ 6. Ninths.

### Plan of a Lesson on Time.

1. Commence with *two-pulse measures*. The class will *listen* to the teacher, who will *taa* a simple passage.
2. The class then *imitate*, the teacher beating time.
3. The class should then be divided into two divisions, and *each division* should *taa alternate measures*, still keeping the swing of the time.
4. The exercise should then be practised at *varying rates* of time.
5. The *accent* should be marked in each measure.
6. The exercise should then be *taa-ed*. This exercise is not important in simple measures, but it is more important when there is a variety of time names introduced.
7. *Continuation* lines and *half-pulses* might then be introduced, and exercises given upon them.
8. The *quarter-pulse* should not be introduced for some time, in fact not until the children reach a higher music class in large schools.
9. The *other measures* should be gradually introduced, but no harder time divisions than quarter-pulses should at present be included.
10. Harder time divisions (*thirds*, etc.) should be relegated to later lessons and more advanced classes.

**Things to Remember in Teaching Time.**

1. With the help of the time chart, time should be studied *separately* from tune—at first.
2. The teacher has to set up an *association* between syllable and rhythm.
3. The teacher should *pattern and point* on the time chart.
4. The pupils should *imitate*.
5. Then pupils and teacher should *taa-tai alternately*, measure for measure at first, and longer passages afterwards. This gives "swing".
6. The *rate* should be varied.
7. The class should sing *without the teacher pointing*.
8. *Exercises* should then be written on the B.B., or sung from books.
9. Finally, the passages should be *taa-ed*.

**Rhythm.**—To teach this suitable examples should be given, in which the rhythm may be made obvious. Each time exercise should be *taa-tai-ed* on various tune forms. The method suggested is:—

1. The teacher prepares some suitable *time exercises*, and sol-fahs or sings one of them.
2. The teacher now points the same exercise on the *modulator*, but *taa-tais*.
3. The pupils *imitate*. The object is to show the sameness of the rhythm and the difference in the tune. The time names show the sameness of the rhythm, and the modulator the difference in the time.
4. The pupils should then sing the same exercises from their books, or charts, or from the B. B.

**SONGS.**

**A. Choice of School Songs.**—School songs should be chosen with some care, and with proper consideration for the nature of the music and the words.

**I. Suitable Songs.**—These will embrace:—

1. Those which express natural sentiments.
2. Those which express the hopes of industry.
3. Songs dealing with the comfort and contentment of household life.
4. Patriotic songs—such as preserve the traditions of the country's triumphs, and inspire the pupils with confidence in its greatness and strength. These will include some war songs, and the national songs; but the teacher must guard against anything like the glorification of war.
5. Songs embodying the national legends.
6. Songs dealing with chivalry, bravery, and loyalty.
7. Humorous songs. The humour should be wholesome and intelligible. These songs are very popular with the children.
8. Songs dealing with our national games.
9. Simple descriptive songs, like those dealing with the seasons.

**II. Qualities of a Good School Song.**

1. The *singing* must be sweet and in tune.
2. The *compass* of the song should be suitable.
3. The *words* should be such as the children can understand.
4. The *articulation* must be clear, and the *enunciation* easily intelligible.
5. The *time* must be exact.
6. There must be suitable *expression*.
7. The quality of the *tone* should be pleasing.
8. The *breath* must be properly managed.
9. The *position* of the singer must be healthy and suitable.
10. The *phrasing* must be good.

**B. How to Teach a School Song.****I. For Young Classes.**

1. The words must first be learnt. One verse will be sufficient to begin with.
2. The tune or melody should then be learnt by imitation, phrase by phrase. An instrument should be used for this purpose where one is available. Otherwise, the teacher must vocalise the song.
3. The rest of the words should then be taught.
4. Plenty of practice, pattern work, and correction should follow.

**II. For Higher Classes.**

1. **Preparation.**—Dictate the melody, or write it on the B.B., or distribute books containing it. Neither is yet to be used.
2. **Modulator.**—Point the melody on the modulator. The class should *sol-fah* it, and afterwards *laa* it.
3. **Time.**—The class should then *time* the melody to the *time names* from the B.B. or otherwise, and then *laa* it in proper time.
4. **Melody.**—They should next sing the melody from their books or from the B.B. as the case may be. The melody should be thus repeated until it is known from memory.
5. **Memory.**—Then let the class point the tune from memory, on a modulator written on their slates.
6. **Ear.**—Give ear tests from and based upon the melody.
7. **Words.**—Have the words dictated, learnt, and explained where necessary.
8. **Song.**—The melody should then be sung to the words, the teacher striving to obtain the qualities enumerated above.

**Part Singing.**—This need not be confined to any one division.

**1. Its Advantages.**

- (a) It awakens a strong interest in singing.
- (b) It introduces variety.
- (c) It cultivates the sense of musical harmony, and so increases the feeling of pleasure derived from vocal music.
- (d) It cultivates the taste for a pure and cheap form of amusement.
- (e) It is an important aid to ear and voice training.

**2. Its Teaching.**

- (a) At first let the music be *simple* and *easy*. Do not be too anxious to murder ambitious pieces. This applies to time and tune.
- (b) Choose a *major key*, and at first have *no chromatics or accidentals*.
- (c) Commence with *rounds*. This trains their "holding" powers.
- (d) Then proceed to *simple part singing*. Before this can be done examine the children's voices, and arrange the class so as to have the worst voices in front, thus:—

Best trebles	Best altos
Inferior trebles	Inferior altos

Give the trebles and altos some separate training exercises, so as to get even production from both parts.

- (e) Let the whole class sing the alto (or second treble) before the first treble is touched at all. This is to be continued until the alto part is well rendered.

- (f) Where possible, then have the piece played, and let the whole class sing alto.
- (g) Have the treble well sung by the trebles. Repeat till well done.
- (h) Then let the two parts be sung together with the piano, and afterwards without the piano.
- (i) Have the words learnt, and the piece rendered with due expression in two parts, with the words.

### SINGING FLAT.

Its Causes.	Its Remedies.
<p><b>1. Voice.</b> The singing may be too loud ; it may be forced, strained, or coarse ; or carelessly rendered ; or it may arise from physical weakness ; or from neglect of breathing places, and consequent exhaustion ; from weather (damp or cold) ; from overstrain or fatigue ; or from a bad atmosphere in the school.</p> <p><b>2. Ear.</b> There may be defects of the ear, and very often the remedy is slower in its operation.</p> <p><b>3. Discipline.</b> The singing may be lax and careless, or the pupils may be inattentive, or in a bad position.</p> <p><b>4. No Interest.</b> There may be a lack of interest from some cause or other. Cases of this sort are rare.</p> <p><b>5. Breath.</b></p>	<p><b>1.</b> Make the pupils sing softly, and listen to the phrase when sung or played in tune. Test with the tuning fork or instrument. Practise in the key of C, and let the passage always finish on C. Strike the fork on the last note. The flatness becomes thus a reality to the class, and greater efforts are made to conquer it. If the school possesses an instrument they can be similarly tested and corrected in any key. The remedies in the other case are obvious.</p> <p><b>2.</b> Plenty of pattern singing will be required. Modulator exercises should be slowly sung from the pattern of the teacher or the instrument. This must be supplemented with ear tests and the study of mental effects.</p> <p><b>3.</b> The remedy here is obvious.</p> <p><b>4.</b> The cause must be ascertained, and if possible removed. The intrinsic charm of the subject will then create its own interest.</p> <p><b>5.</b> See notes on voice training.</p>

### HOW TO TEACH ROUNDS.

"The practice of teaching rounds is most valuable and interesting in class singing. Rounds are the happiest possible means of bridging the chasm between unison and part singing, and they often provide infinite delight and amusement for young pupils."

#### Teaching.

1. First see that your class is fit to commence the study. A class should be able to sing smoothly in unison before attempting even a simple round.
2. Silence the flat singers and growlers.
3. Next get your round. Let it be a simple one at first, with a range not greater than an octave.
4. Choose melodious rounds. They are easier to remember.
5. Do not choose rounds with rests, especially if the rests are on accented pulses. Plain smooth rhythm stands the best chance.
6. Words with a little innocent fun in them are sometimes desirable. Avoid words which are too obviously moral lessons.
7. Let the class learn the whole melody of the round as a unison song. It should be sol-fah-ed, then laa-ed, then sung to words.

8. Divide the class into as many sections as necessary. They can then be arranged either side by side, or behind each other. But the plan and furniture of the room will be an important factor in most arrangements. The one section behind the other is the best arrangement, because nearly every pupil can hear and feel the onslaught of the other parts.
  - (a) Make each section separately sing the round as a melody.
  - (b) The teacher should then "pit" himself against the whole class as the second part of the round.
  - (c) When possible, sing against each section. If the class is very large, subdivide the sections and sing against each.
  - (d) Let six picked pupils sing the round against the teacher.
  - (e) If successful, add six more.
  - (f) Then group the two sixes separately in a circle, and try them against one another.
  - (g) As this succeeds, keep adding to the number of each group until the two full sections are singing one against the other. This arrangement is recommended by high authorities for two-part rounds.
9. Three and four part rounds are more interesting, and will follow the others.
  - (a) Let them be sung first as two-part rounds, and sing the third part yourself.
  - (b) Divide the class into three sections, and make any two sections sing in two parts.
  - (c) Practise the three sections in three parts.
  - (d) Proceed in the same cautious way for four parts.
10. In choosing rounds with a view to give special practice in time, it is well to select those that have at least one part that firmly marks the beat or pulse.

### DEFECTS IN SCHOOL SINGING.

The most common defects in school singing have been thus summarised by one of H.M. Inspectors :—

1. Want of voice cultivation, resulting in an unmelodious quality of voice, harshness characterising the boys' and stridency the girls' voices.
2. A faulty balance of voices, the boys' voices, as a rule, being too predominant. A proper relation of the two elements should be aimed at.
3. Insufficient weeding out of bad, untrue, and incurably harsh voices.
4. Inadequate range of voice, leading to the injudicious selection of too low keys.
5. Want of expression. The singing is often tame and apathetic, and the teacher is often a mere animated metronome.

### PROPER DIVISION OF TIME.

For a half-hour's lesson the following arrangement of the time is recommended :—

3	minutes for	<i>voice</i> exercise.
5	"	modulator exercise for <i>tune</i> .
5	"	<i>time</i> —on charts and B.B.
3	"	<i>ear</i> —the teacher to give exercises.
6	"	<i>time and tune</i> —from charts or books.
8	"	<i>songs</i> —from books, as a rule.

### QUALIFICATIONS OF A CONDUCTOR. (Barnby.)

1. Abundant technical knowledge.
2. Experience.
3. A strong will.
4. Magnetic influence.

5. A quick ear.
6. A sharp tongue.
7. A good memory.
8. A clear beat.

The conductor is not to be always looking at his book or his copy, but is to be *en rapport* with his class.

### **CHOIR EFFICIENCY.**

There are some essential tests of efficiency in a choir or singing class.

1. Perfect time.
2. Good intonation.
3. Well-balanced parts.
4. The tone must be of good quality.
5. The expression marks must be accurately and tastefully rendered.
6. The articulation must be clear. The proper use of the lips, tongue, and teeth is much neglected.
7. The phrasing must be good. "Ragged edges" should be avoided. The attack should be simultaneous, and the release of the last note equally so.
8. There should be soul or feeling in the singing.

### **EXAMINATION QUESTIONS.**

- 1.—Describe the best method of proceeding in teaching a new song to infants or to older children.
- 2.—Describe the method you adopt in teaching "singing by note" to a class of beginners.



■

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## SCHOOL ECONOMY.

**BUILDING.** *From the Day School Code of 1896.*

**Planning and Accommodation.**—In planning a school, the first thing is to seat the children in the best manner for being taught. The accommodation of each room depends not merely on its *area*, but also on its *shape* (especially in relation to the kind of desk proposed), *the positions of the doors and fireplaces*, and its *proper lighting*. The second point is to group the rooms together in a compact and convenient manner.

**Schoolrooms.**—Every school must have a schoolroom or a central hall. The *proper width* for a schoolroom is from 18 to 22 feet. In a room 18 feet wide groups of long desks, three deep, should be used; where four rows are used the width should be 21 feet 6 inches, and if the width is 22 feet, dual desks, five rows deep, are most suitable.

(a) Accommodation in schoolrooms for elder children is calculated by the number of children seated at desks and benches, subject to a minimum of 10 square feet per child being provided.

(b) Double bank schools (now almost obsolete) require rooms 32 feet wide, walls left clear for three rows of desks, and ample lighting from windows on both sides extending to ceiling.

(c) Wasted space cannot be considered.

The doors and fireplaces in schoolrooms must be so placed as to allow of the whole of one side of the schoolroom being left free for the groups of benches and desks.

(d) **No schoolroom lighted from one side only can be approved.** The gable ends should be fully utilised for windows.

**Walls, Floors and Roofs.**—The walls of every schoolroom and class-room, *if ceiled at the level of the wall-plate*, must be at least 12 feet high from the level of the floor to the ceiling; and if the area contain more than 360 superficial square feet, 13 feet, and if more than 600, then 14 feet.

(a) The walls of every schoolroom and class-room, *if ceiled to the rafters and collar beam*, must be at least 11 feet high from the floor to the wall-plate, and at least 14 feet to the ceiling across the collar beam.

(b) Great care should be taken to render the roofs impervious to cold and heat.

(c) **Roofs open to the apex are not approved.** They can only be permitted where the roofs are specially impervious to heat and cold, and where apex-ventilation is provided. Iron tie-rods are least unsightly when placed horizontally.

(d) The whole of the external walls of the school and residence must be solid. *If of brick*, the thickness must be at least one brick and a half, and *if of stone*, at least 20 inches.

(e) All walls, not excepting fence walls, should have a damp-proof course just above the ground line.

(f) The vegetable soil within the area of the building should be removed, the whole space covered by a layer of concrete not less than 6 inches thick, and air bricks inserted in *opposite* walls to ensure a through current of air under floors for ventilation to joists.

(g) Timber should be protected from mortar and cement by asphalt or tar.

**Entrances.**—Entrances should be separate for each department. In large schools more than one entrance to each department is desirable. The principal entrances should never be through the cloak-room. Entrance doors should open outwards as well as inwards. A porch should be external to the schoolroom.

**Cloak-rooms and Lavatories.**—Cloak-rooms must be external to schoolrooms and class-rooms, with gangways at least 4 feet wide, amply lighted from *the end*. Hat-pegs should be 12 inches apart, numbered, and of two tiers. The hanging-space necessary to provide a separate peg for each child is thus 6 inches lineal.

Thorough ventilation is essential, so that smells are not carried into the school.

Lavatory basins are needed. Girls' schools require a larger number than boys' or infants'.

A lock-up slop sink, water tap, and cupboard are desirable for the caretaker.

**Class-rooms.**—Class-rooms are calculated at 10 square feet, if not providing accommodation for more than 60 children. Six rows of dual desks or four rows of long-length desks are permissible in such class-rooms. When the front of a class is narrowed, but the area of the room is not reduced, a seventh row of dual desks or a fifth row of long desks may be allowed.

(a) The minimum size of a class-room is 18 feet  $\times$  15 feet. If desks are placed longitudinally the width should not be less than 16 feet. This latter width is also allowed in schoolrooms of very small size.

(b) **The class-rooms should never be passage-rooms from one part of the building to another nor from the schoolrooms to the playground or yard,** and should be on the same level as the schoolroom. Each should be easily cleared without disturbance to any other room. **Doors should open both ways.**

(c) The number of class-rooms should, where practicable, equal the number of classes in the schoolroom; usually five class-rooms are necessary for the six standards.

(d) The excessive use of movable partitions should be avoided.

**Halls.**—Large schools are sometimes planned with a central hall, from which the class-rooms are entered. The hall must be fully lighted, warmed and ventilated, and must contain a floor space of not less than 1200 square feet. Halls of excessive size are not approved.

If desired, one class (or under special circumstances two classes) will be allowed in the central hall, provided the hall is suitably planned for teaching such class or classes.

**Windows.**—Every part and corner of a school should be fully lighted. The light should, as far as possible, and especially in class-rooms, be admitted from the left side of the scholars. All other windows in class-rooms should be regarded as supplementary, or for summer ventilation. Where left light is impossible, right light is next best. Windows

full in the eyes of teachers or scholars are not approved. In rooms 14 feet high any space beyond 24 feet from the window wall is insufficiently lighted.

(a) Windows should never be provided for the sake merely of external effect. All kinds of glazing which diminish the light and are troublesome to keep clean and in repair should be avoided. A large portion of each window should be made to open for ventilation and for cleaning.

(b) The sills of the main lighting windows should be placed about 4 feet above the floor. The tops of some windows should reach nearly to the ceiling, with a portion made to swing. The ordinary rules respecting hospitals should here be remembered. *Large spaces between the window heads and the ceiling are productive of foul rooms.*

(c) Skylights are objectionable, and should never be resorted to where windows are possible. Plans needlessly involving their use cannot be approved, except in the case of central halls having ridge or apex ventilation.

**Staircases.**—A staircase must be external to the schoolroom. No triangular steps or "winders" should be used. Each step should be about 13 inches broad, and not more than  $5\frac{1}{2}$  to 6 inches high. The flights should be short, and the landings unbroken by steps. The number of staircases should be sufficient, not only for daily use, but also for rapid exit in case of fire or panic.

**Ventilation.**—Apart from open windows and doors, there should be provision for copious inlet of fresh air; also for outlet of foul air at the highest point of the room. The best way of providing the latter is to build to each room a separate air chimney, carried up in the same stack with smoke flues. **An outlet should have motive power by heat or exhaust, otherwise it will frequently act as a cold inlet.** The principal point in all ventilation is to prevent stagnant air. Particular expedients are only subsidiary to this main direction. Inlets should provide a minimum of  $2\frac{1}{2}$  square inches per child, and outlets a minimum of 2 inches. **Rooms should, in addition, be flushed with fresh air from windows about every two hours.**

A sunny aspect is especially valuable for children, and important in its effects on ventilation and health.

Although lighting from the left hand is considered so important, ventilation in summer demands also the provision of a small swing window as far from the lighting as possible and near the ceiling.

### **WARMING.**

A common stove, with a pipe through the wall or roof, can under no circumstances be allowed. Stoves must also be of such a pattern that they cannot become red hot, and they must be supplied with fresh air direct from the outside by a flue of not less than 72 inches superficial. They must also be of such a size or shape as not to interfere with the floor space necessary for teaching purposes.

### **SANITARY ARRANGEMENTS.**

Water-closets within the main school building are not desirable, and are only sanctioned for women teachers. All others should be at a short distance, and completely disconnected from the school. Privies should be fully twenty feet distant.

(a) The doors, staircases and passages leading from the schoolroom to the latrines (whether in mixed or in other schools), and the latrines themselves must



be separate for the two sexes, and constructed entirely apart from each other. In the case of a mixed school this rule especially affects the planning. Where passages or corridors are *unavoidably* used by both sexes there must be complete supervision from the class-rooms by sheets of clear glass.

(b) Each closet must not be less than 2 feet 3 inches wide, nor more than 3 feet, *fully lighted and ventilated*, and properly screened or supplied with a door. More than one seat is not allowed in any closet.

(c) The children must not be obliged to pass in front of the teacher's residence in order to reach the latrines.

(d) The following table shows approximately the number of closets needed :—

No. of Children.	Girls.	Boys.	Infants.
30	2	1	2
50	3	2	3
70	4	2	3
100	5	3	4
150	6	3	5
200	7	4	6
300	8	5	7
		Urinals in proportion.	

(e) Cesspits and privies should only be used where unavoidable, and should be at a distance of at least 20 feet from the school. Earth or ash closets of an approved type may be employed in rural districts, but drains for the disposal of slops and surface water are still necessary. The proximity of drinking wells should be carefully avoided.

(f) Soil drains must always be laid outside the building (on a hard even bottom of concrete) in straight lines with glazed stoneware pipes, carefully jointed in cement and made absolutely water-tight. A diameter of 4 inches is sufficient, unless for drains receiving the discharge of more than 10 closets. Above this number the diameter should be 6 inches. The fall should never be less than 1 in 30 for 4-inch and 1 in 40 for 6-inch drains. An inspection opening or chamber should be provided at each change of direction so as to facilitate cleansing the drain without opening the ground. Every soil drain must be disconnected from the main sewer by a properly constructed trap placed on the line of drain between the latrines and the public sewer. This trap must be thoroughly ventilated by at least two untrapped openings; one being the 4-inch soil pipe carried up full size above the roof, and the other an inlet pipe connected with the side of the trap furthest from the public sewer. Automatic flushing tanks are desirable where trough closets are used.

(g) Urinals must in all cases have a sufficient supply of water for flushing.

(h) Waste pipes from sinks or lavatories should be first trapped inside and then made to discharge direct through an outer wall over a trapped gully.

**Sites and Playgrounds.**—Every school should have an open, airy playground proportioned to the size and needs of the school. The minimum size of site is, in the absence of exceptional circumstances, a quarter of an acre for every 250 children. If the school is of more than one story this area may be proportionally reduced. The minimum open space is 30 square feet per child.

(a) In the case of a mixed school, playgrounds must be separate for the boys and girls.

(b) All playgrounds should be properly levelled, drained, enclosed and fitted

with some simple appliances. A portion should be covered, having one side against a wall. A covered way should never connect the offices with the main building. Buttresses and corners should be avoided.

(c) An infant school should have its playground on the same level as the school, and open to the sunshine.

**Infant Schools.**—Infants should not, except in very small schools, be taught in the same room with older children, as the noise and the training of the infants disturb and injuriously affect the discipline and instruction of the other children.

(a) There must be no opening wider than an ordinary doorway between an infants' and any other schoolroom, because of the sound of the infant teaching.

(b) An infant school (and playground) should always be on the ground floor, and if more than 80 scholars are admitted, should have one gallery and a small group of benches and desks for the occasional use of the older infants.

(c) No infant gallery should hold more than eighty or ninety infants, nor in a babies' room more than fifty. It should be well lighted from one side. The light for object lessons is as good from the right as from the left.

(d) The width of an infant schoolroom should be in proportion to its size, but not more than 24 feet. **A covered marching-ground is desirable.**

(e) **The babies' room should always have an open fire and be maintained at a temperature of about 65°.** As a rule it should not contain more than fifty children. Large schools may require two communicating rooms for babies, one fitted with low kindergarten desks, the other providing ample floor space for exercises.

(f) The accommodation of an infant school is calculated at 8 square feet for each child after deducting wasted or useless space, but a larger area should be allowed wherever practicable. Care should be taken that the numbers are conveniently seated, and that space is left for marching. Where a second standard is taught in an infant school the accommodation for it is calculated at 10 square feet per child.

### CARE OF THE VOICE.

The human voice is governed by the laws regulating sound. It is a **musical instrument**, and like any other musical instrument *it soon shows the effect of any change in its condition.*

So far as children's voices are concerned, enough has already been said in the chapters on *Reading* and *Music* to guide the teacher in their management. The great thing is to avoid **strain and cold**. The teacher can easily regulate the voices in school, but *it is in the playground and the street where the mischief from straining will occur* if it occurs at all. Speaking generally the same will be true of cold. Reasonable care is generally forthcoming in the school, but the straining of the voice in the street which characterises many children probably makes the strained organ more susceptible to cold. The teacher cannot do much in the matter except to **advise restraint and care**.

But this is more a **teacher's question** than a scholar's. Laryngitis among teachers has become sufficiently prevalent to excite medical attention and remark, and it would be better if every teacher had some **anatomical knowledge of the organs of voice**, for *improper use of the voice leads to changes in the tissues of the larynx*. Pupil teachers come to their work at a critical period for their voices. The vocal organs, which are comparatively small in children, begin to grow as puberty is reached, hence they are in an unfavourable condition for sustained vocal effort.

Some teachers work under exceptionable voice difficulties from the nature of the locality in which the school is placed. The noise and roar of the streets are almost continuous, and the teacher's voice is sure to

suffer sooner or later. He may exercise all reasonable care; he may have a separate class-room; the floor may be stepped; but he cannot shift the position of the school, check the costers and piano grinders, soften the noise of the traffic, or stop the loud whoops of the many milkmen. Noisy animals, steam organs and steam roundabouts are also not unknown near some schools. The remedy unfortunately in cases like these lies outside the teacher's power. The best he can do is to **enlist the sympathy of the local governing body**, who may be able to deal with the noisy animals and steam roundabouts, and who, perhaps, might be induced to asphalt or wood-pave that portion of the street in which the school stands.

Generally the means of warming a school will not be of a kind to produce such a **dryness of the atmosphere** as to irritate the throat. If any cases of this kind still exist, the means for destroying this dryness are easily within the teacher's reach, and should be utilised. Irritation to the throat may also be caused through the presence of **foreign bodies in the air**, and the grappling with this difficulty will depend upon its origin. It probably will be beyond the teacher's control. The **temperature of the room** is important. Overcrowded or overheated rooms are bad in many ways, and for the voice among others. Ventilation will remove much of this evil, but further mischief may arise from **sudden exposure** to the raw, cold air after quitting such a room, and the teacher must be careful to guard both the children and himself from such risks.

The throat may be weak from **constitutional causes**, which in their turn may be due to some *serious illness* or to *heredity*; and although the teacher cannot do much in such cases, he can at least exercise ordinary care and forethought. Throat affections are sometimes due to **disorders of the stomach and to indigestion** generally. Where such is known to be the case, the teacher should be ready to advise suitable habits and diet for restoring the natural tone of the pupil, and the Physiology and Domestic Economy lessons might be utilised for the same purpose. The children could be advised to **keep their feet warm and dry** at all times, and **they should never be allowed to sit in wet garments at school**. Both of these are fertile sources of bad throats and injured voices, and both suggested remedies are well within the teacher's power.

**Habit** is very often responsible for disorders of the throat and voice. "**Coddling**" oneself is probably one of the worst of such habits, and the practice of **over-muffling the throat** is far too prevalent. When the body has been made very warm, the throat is often muffled and the body neglected; but the reverse should rather be the practice. It is the body that requires keeping warm, although the throat should not be forgotten. The teacher should remember these facts and act up to them. It has also been stated by medical men that **respirators** are unnecessarily, and so, injuriously worn by some people. The necessity for the respirator in some cases is not denied; but in raw, cold weather, and in biting winds **the mouth should be kept shut, and the breathing should be done through the nose**. In fact it should be done through the nose at all times, but especially so in such cases. Nature will then supply her own respirator in the soft mucous membrane over which the air has to pass. **Tight boots, iced drinks, and hot drinks** are also said to be bad for the throat and voice. Perhaps it is unnecessary to warn teachers against the injurious effects to the throat and voice of excessive drinking or smoking.

**But the young teacher must trust chiefly to himself. He must culti-**

vate an easy vocal delivery, and let neither zeal, excitement, nor external noise tempt him to overpitch his voice. He can attend to the ventilation of the room, and exercise reasonable care at all times.

### CARE OF THE EYES.

Defective eyesight among the children may arise from a variety of causes, but it is the teacher's duty to see that none of those causes are traceable to the school. Speaking generally, *prevention* is the teacher's work; *cure*, the doctor's. By the adoption and consistent enforcement of a few simple rules, much may be done to check the impairment of the sight during school hours.

1. **Light.**—The rooms require to be **well lighted**; *i.e.*, there should be a sufficiency of light **without glare**, and the light should be **evenly distributed**. The direction of the light is very important (see page 2), and so is the angle at which it falls on the paper.
2. **Printing.**—The **printing** in the school books **should be good**, being marked by clearness, good spacing, decent sized type, and general good finish.
3. **Position.**—Every child should be supplied with a **healthy and comfortable seat** (see *Desks*, page 9). The height, dimensions and build of the desks need supervision, so that each child may be most advantageously placed. Where possible, three sizes of desks should be found in each class, so that the children could be seated according to their size. This will give a fair average of suitability, and will, among other things, aid the discipline and efficiency of the class. To place children differing so much in physical build in similar desks is to indulge in a practice which tends to produce short sight. **The muscles of the eye will be unequally worked**, with the probable result of a loss of tone and power.
4. **Penmanship and Needlework.**—These are really special cases under (3), but they are such fertile sources of bad posture and bad eyesight that it has been deemed advisable to note them particularly (see *Position for Writing*, page 196). Where very small writing is allowed the evil becomes intensified. The teacher should insist on the cultivation of a bold and rather large style of small hand, so as to remove any strain on the eyes. The disastrous results accruing to the eyesight through very "fine-stitch" needlework have happily been discovered only to be denounced and discouraged. It is the teacher's duty to see that there is no reversion to them.
5. **Homework.**—Where homework is given, **writing should be reduced to a minimum**, and the same supervision as to printing should be exercised over the books used for home lessons as in the case of school books. Among other discomforts, it must be remembered that many children have to do their homework in very badly lighted rooms. The children should also be advised **never to read in a bad light**. Homework is one of the most fertile sources of overworking the eyes.
6. **Spectacles.** The teacher's work here is to advise. Children with defective sight are sooner or later detected by means of their school work. The parents should be acquainted with the fact (if necessary), and advised to consult a competent authority. The sight is too precious to be neglected, or to be experimented upon by amateurs in such cases. Spectacles may or may not be necessary, but the importance of taking good advice in time should be strongly urged.

It is not uncommon to find a *difference of focussing power* in the two eyes, and when we remember that the eye-ball is worked by six muscles, plus the muscles regulating the eye-lid, it is easy to understand that under certain conditions *any one of these muscles may be more or less disabled*. Now, if the focussing power of each eye is

different there will obviously be a difference in the sight of the eyes, and this difference is a source of discomfort. This discomfort arises from double vision, and the child's efforts to remove the annoyance lead to *squinting*. The muscles of the two eyes are of unequal strength, and in the struggle the eye with the weaker muscle has the image on its retina suppressed. But weakness in focussing power may occur in children through *constitutional weakness*, and in such cases the eyes should be carefully used. **No fine work involving any strain should be permitted** until the general health is restored. The teacher's work in such cases, within the limits of his knowledge and power, will be to **see that objects are placed at a right focus**, so as to check and correct a misfortune which may become permanent. And it is the more important that he should do his best from the fact that *most short-sighted children are said to have lateral curvature of the spine*. He should persistently strive to alter the injurious habits of the children in question. Probably the best way of doing this will be to think out some kind of *exercise* which will increase the work of the idle muscles, and decrease that of the overworked ones. It has also been medically advised that **children with short sight should read together, and should be drilled in the use of those muscles which regulate distance**, but how far this may be possible in the ordinary day school the circumstances of each school must decide for itself.

7. **Temperature.** The *ventilation* of the school should be good, so as to protect the children from *draughts*, which might injure the eyes. Children should also be advised not to sit over a *fire*, either staring at it or reading by its light.
8. **Atmosphere.** The presence of *foreign bodies* in the atmosphere may injure the eyes. So far as the schoolroom is concerned the teacher can see that it is properly cleaned at suitable intervals, that it is regularly and well swept, that the furniture is daily dusted, and that chalk-laden dusters are not shaken out inside the school. The presence of certain trades or factories near the school may increase the risk from this source.

### THEIRFT.

In a circular issued from the Education Department in July, 1881, occasion was taken to urge the consideration of this subject upon all concerned in the management of elementary schools, and this appeal met with a ready response in many parts of the country. During the years which have since elapsed the number of banks in connection with elementary schools under inspection has greatly increased. Much, however, yet remains to be done in this direction, and *the practical abolition of school fees has rendered it easier for managers and teachers to enlist the co-operation of parents*, and to bring under their special notice the existence of the **School Bank** and the use which might now be made of it.

The **general principles** which should be kept in view in relation to this and kindred means of extending the usefulness of our public elementary schools have been repeatedly brought under the notice of managers. In these instructions, a copy of which is required by Article 8 of the Code to be kept in every school, it is pointed out (paragraph 51) that:—

1. A good school under favourable conditions does not limit its work to the scheme of instruction prescribed in the Code, or
2. To preparation for examinations;
3. But seeks by many subsidiary expedients to render service to the children, and
4. To exert a right influence on their characters and their aims in life,

Among these expedients the provision of a **School Savings Bank** is specially enumerated.

**Reasons for Banks.**—Experience has shown that many of the evils which weigh most seriously on the industrial classes in this country are the results of **improvidence** and **waste**. But **some of these evils admit at least of partial remedy**; *e.g.*, the children might learn:—

1. How to economise slender resources;
2. How to resist temptation to needless expense;
3. How to make reasonable provision for future contingencies.

Such knowledge is calculated to protect its possessor from much trouble and humiliation, and to help him greatly in leading an honourable and independent life.

In mature years it is often found difficult to acquire this knowledge, and still more difficult to apply it in practice. But in a school much may be done to render its acquisition easy to children, and to show them the advantages of **economy** and **foresight**. For this purpose they might also learn simple lessons:—

1. On money;
2. On the conditions which affect the rate of wages;
3. On the relations of skill, prudence and knowledge to industrial success;
4. And on right ways of spending and saving.

**Economy, however, is a habit, and is to be learned as other habits are learned, rather by practising it than by listening to demonstrations of its importance.** During the school life of a child there arise many temptations to the heedless and wasteful expenditure of small sums; and many occasions on which, if the opportunity were offered, such sums might be usefully and wisely saved. The child who is helped to deny himself some trifling present gratification, who is encouraged to save by degrees a few shillings, and who finds this sum available for the purchase of books or clothes, for helping his parents at a time of family misfortune, or ultimately for his own equipment on leaving school for work, *has received a practical lesson in forethought and self-restraint which will probably abide with him for life.*

**The value of such a lesson** is not to be measured solely by its effect on the scholar's own character and welfare. **It exercises a reflex influence on the whole household to which he belongs.** And when a parent resolves to set apart even a portion of the pence saved under the Education Act of 1891, and to deposit it regularly in the scholar's bank, **the educating work of the school is extended to the home**, the interest of other members of the family is excited, small economies become easier, and the savings bank, which at first receives only a few trifling sums, becomes recognised as a household institution, to be maintained long after the school life of the youngest child is ended. The possession of even a small reserve or capital places it in the power of the workman gradually to acquire the ownership of his house or a piece of land, to take a share in an industrial partnership, or to enter on a small business, which, although at the outset it may only employ himself and his family, may, by his economy, industry and skill, become the means of employment to many others, and so contribute to the general prosperity. *Thrift and temperance are very nearly allied*; each is helpful to the other, and having regard to the enormous waste caused by intemperance, there can be little doubt that if

the people of these islands were more temperate and thrifty, our home trade and the profitable employment of our people therein would be very greatly increased.

### **Examples of Thrift.**

1. The well-known thrift of the peasantry and artisans of **France** has had a remarkable influence in adding to their comfort and sense of independence, in developing the commerce and manufactures of that country, and in enabling her people some years ago to recover with extraordinary rapidity from the effect of a great national calamity. It cannot be doubted that the institution of the School Savings Bank—*caisse d'épargne scolaire*—has contributed largely to this result.
2. In **Belgium**, a country with more than six million inhabitants, the School Savings Bank is also a very popular institution, and is largely used by parents in making their earlier and humbler efforts in economy before they are able to open accounts in their own names.
3. No such extensive use has yet been made of the school bank system in our own country. But in certain places, and wherever the experiment has been tried in a judicious, business-like and kindly spirit, it has proved remarkably successful. For example, in the single city of **Liverpool** many school banks have been established in connection with the *Liverpool Penny Savings Bank Association*, and year by year the number of deposits increases. When the child's deposits in the *School Penny Bank* amount to ten shillings, that sum or the multiple of it is transferred in his or her own name to the *Liverpool Savings Bank*, certified under the Act of 1863. This practice lightens the responsibility of the school authorities, and introduces the depositors to a savings bank which they may continue to use after leaving school.

These results have been achieved without the pressure of any authority, but mainly by the voluntary exertions of the friends and managers of schools, and by the intelligent co-operation of the teachers. The advantages of thrift have first been simply explained to the children, and then opportunities for its exercise have been placed within easy reach. In some schools in which it has been the practice to give small *money premiums for special proficiency, industry or good conduct*, the prize has taken the form of a deposit in the savings bank in the scholar's name, so that on leaving school he has been presented with a bank book and a substantial nucleus for future saving.

**Temporary Devices for Thrift.**—**Penny Banks and Provident Clubs** of various kinds have already been founded in many schools aided by the Parliamentary grant. In *Glasgow, Manchester, Hull*, and other large towns, as well as in *Liverpool*, the trustees of savings banks certified under the Act of 1863 have been actively instrumental in their formation. There should be no wish to interfere with any existing plans which are found to work well. **Every expedient which encourages economy and forethought has its educational value.** But *shoe clubs, clothing clubs and other temporary devices*, which merely aim at supplying a particular want, have the disadvantage that they do not last after that want is satisfied, and are of little service in the formation of a permanent habit. What is to be desired is that the scholars should become early familiar with the practice of saving in view of any possible future need. It is desired therefore to remind school managers and teachers of the special facilities offered by the Post Office for the establishment of penny banks in schools. Such banks when formed may readily be placed in connection with the local Post Office Savings Bank. *Small books for the use of children have been prepared, and*

are issued gratuitously by the *Savings Bank Department*, and the necessary rules, which are few and simple, will be found printed in each of these books. *Suitable ledgers* for keeping the accounts of the school bank in a simple form can also be obtained at a small price. Deposits of small sums should be entered in the scholar's book and in the school ledger, and as soon as the sum paid by any depositor reaches a sufficient amount he should be assisted to open a separate account in his own name in the Post Office Savings Bank. He will thus be able, if he wish it, to make his subsequent payments direct to the Post Office. While fully appreciating the services which teachers may render in the way of economy, no one would wish to cast upon them any additional labour and responsibility which might interfere with the proper discharge of daily duties. *It will be necessary to have the goodwill of school managers for help in devising and carrying out the needful arrangements.* Two or three members of a local committee may act as trustees of the school bank and may open an account with the nearest *Post Office Savings Bank*. On two or three mornings in the week one of the number should be present to receive deposits, and to conduct the simple business connected with the withdrawal of money or its transfer to the *Post Office Bank*; or this may be done by the teacher himself.

The general adoption of such a plan will greatly increase the usefulness of the elementary schools as instruments for the formation of character, and will, in present circumstances, not be without a valuable influence in awakening the sympathy and interest of parents. The co-operation of members of School Committees and Boards and of those persons of leisure and influence who are interested in elementary schools and in the future well-being of the scholars should be invited. The annual return (Form 9) required to be filled up by managers has long contained a question respecting the existence of a bank in the school, and there has recently been introduced into this form two further questions respecting the number of scholar-depositors and the total amount standing to their credit.

Some additional facilities offered by the Postmaster-General for the banking of school pence will be found appended.

**Additional Facilities for the Banking of School Pence.**—With a view to the further encouragement of thrift, the Postmaster-General has decided that, **in cases where school managers and teachers find the penny bank system unsuited to their requirements**, he will render them assistance on the following lines :—

Upon application being made to the Controlier of the Savings Bank Department, the manager or teacher will be supplied with stamp deposit forms of either of the following descriptions, *viz.* : (1) forms containing spaces for twelve stamps, with which envelopes will be supplied for the safe keeping of the forms; or (2) forms containing spaces for forty-eight stamps, folded to a convenient size, and printed on much stouter paper, not requiring the protection of an envelope. The name of the school, with a space for the name of the scholar, will be printed on the forms.

*N.B.*—The use of the form with spaces for forty-eight stamps will be of advantage to the Post Office, inasmuch as it will tend to lessen the unavoidable expense of dealing with frequent deposits of amounts under four shillings.

If required, a credit stock of stamps can be obtained by furnishing a letter of indemnity signed by two householders. A form for the purpose is provided by the Savings Bank Department.

On the day appointed for the receipt of the pence saved, the manager or teacher will exchange them for stamps, and see the stamps affixed to the forms, which the children will take home as evidence to the parents of the money,



having been paid in, the forms being then either kept by the parents or returned to the school until the next depositing day.

When the school is within a reasonable distance of a Post Office, and the number of depositors and the amount to be deposited are sufficient to justify the cost, a Post Office clerk will attend at the school at certain intervals, say monthly or quarterly, according to arrangement, to receive the completed stamp forms as deposits in the Post Office Savings Bank.

Where the school is situated in a remote district, or in cases where the transactions are not numerous, the following arrangements have been made to assist the managers and teachers in bringing the deposits to account, *viz.* :—

- (1) In order to open an account in the name of a child over seven years of age in the Post Office Savings Bank, a form of declaration (S.B., No. 8) should be filled up and signed by such child, the signature being attested in accordance with the instructions printed on the back of the form. The declaration should be presented at a Post Office Savings Bank with the completed stamp forms by some one connected with the school, and a deposit book would then be issued in the child's name and handed to the applicant. When the child is under seven years of age, a form of declaration (S.B., No. 8 a) should be filled up and signed on behalf of the child, and presented at the Post Office in like manner. A supply of declaration forms can be obtained at any Post Office Savings Bank.
- (2) If it is inconvenient for any one connected with the school to attend periodically at a Post Office in order to open accounts for the children, arrangements will be made for the manager or teacher to send the completed stamp deposit forms, together with the declarations, in a registered letter envelope to the Post Office. Special envelopes will be provided by the Department for the purpose, and the postage and registration fee will not be charged. The deposit books, when issued, will be forwarded by post to the manager or teacher.

The completed stamp deposit forms could be deposited in accounts already opened by forwarding the deposit books with the stamp deposit forms.

## CLASS TEACHING.

**Chief Defects in Teaching.**—Mr. Sharp, H.M. Senior Inspector, has stated that the chief excellence of modern teaching is the careful and intelligent direction of the steps of reasoning, and that the chief defects are a want of force and local colour.

He defined local colour to mean *especially illustrations from the daily life and surroundings of the scholars*, whatever the subject might be—whether literature, science, or words.

He then goes on to say that years ago, except a few individuals who had been fortunate enough to fall in with an enlightened teacher, children had, to a great extent, been brought up on stereotyped methods from which the essence of the spirit of the first wise teacher who had originated them under entirely different circumstances had long departed. Students of the *History of Education* could often trace the gradual fading away of colour and force in some of the methods of bygone days which might have been arrested by the consideration that **all such methods needed to be varied in their application to modern times.** This was rapidly going on now. The spirit was often absent and the mere husk left.

Years ago, people were brought up in the belief that the committing to memory unintelligible rules of Syntax and long lists of vocables was the correct way of approaching the Divine gift of language. Probably at the time of the revival of learning, when grammars and dictionaries were scarce, no better way could be devised than this cheap method of supplying the raw material of language. But, no doubt, in those early

days the rules were copiously illustrated by the living voice of the wise enthusiast who revived the dead languages in Europe with abundance of force and local colour, and in Scotch schools many a joke was cracked in good Latin. *Unfortunately this method of teaching had been continued after the need for it had ceased—the spirit had departed, and with it went all the force and colour that came from the natural living illustrations.*

**Arithmetic was degraded in the same way to a mere bundle of rules, which had lost all connection with the principles of the science,** and which had for their chief end the teaching of small commercial transactions. Commercial arithmetic was an excellent subject and was now as much in danger of being depreciated as it was before of being over-exalted. Commercial arithmetic should be a leading subject for boys and girls of thirteen or fourteen years of age, but not before they had been so well grounded in the rules of arithmetic **as to enable them to discover new rules and to invest them with local interest and colour gathered from experience.** He had endeavoured in three girls' schools to ascertain whether they had a clear idea, gathered from the ordinary transactions of life within their reach, of the meaning of the terms *above par*, *below par*, and similar phrases which they glibly used in calculations of small investments. In one of these schools the teacher, the girls, and himself agreed to set up a small business, form themselves into a meeting, and take shares. The children then began to take an interest in the success of the undertaking, and thus a real meaning was given to the mysterious terms *above par* and *below par*.

Again, on one occasion he had found a class reciting that charming piece of Longfellow, *The Children's Hour*, repeating it correctly and with a good knowledge of the vocabulary, but with scarcely any interest. But when permitted to dramatise the piece, to act the parts of the three girls named in the poem, their interest was fully aroused.

Yet again, in a class of older girls he had heard a graphic lesson on the most famous buildings in Edinburgh, but it required the interest of human life. The teacher, at his request, had given a short history of the growth of Edinburgh. She had showed the early savage tribes clustering for shelter with their cattle on the Castle Rock, the citizens' wall, and the means of defence in the fortified town; the peaceful men of later date overflowing the narrow boundaries, and then the buildings fell into their natural order, each the result of the wants of the different ages, and thus the touch of human interest was given. Hence, one great feature in the study of methods of teaching should be **the kindling of the spirit of human life and thought, to give a living interest to the teacher's words and a force and colour to the lesson.**

**Self-Help or Self-Activity.**—This is another of those points which have been suggested by H.M. Chief Inspector as fitting subjects for discussion between inspectors and teachers. An important problem for teachers to solve is **how far a particular lesson might have contributed to a habit of self-help or self-activity.** *Did the teacher help the scholars in points which he might have found out for himself and thus have weakened his power of acquiring knowledge?* It should be one of the chief objects to see that they did not help the scholars too much. It must strike every one when they considered how very small a proportion of the well-taught boys and girls who left the schools had acquired the habit of self-help and a desire to increase their knowledge through a continuation class or a higher polytechnic.

This question was mixed up in most schools with that of the *proper*

*treatment of an upper class* in which, perhaps, three standards, as they used to be called, were taught together. *What was the best way to teach a class of Standards VI. and VII. combined?* It could hardly be expected that a scholar in the Seventh Standard should continue at school to be obliged to listen to the same elaboration of the terms of simple grammatical analysis to which he had been accustomed two years before. *This ingrained system of keeping the children in leading strings ran throughout the whole national system*, from the infant who had to dance or play to order and the boy and girl who must have the whole, or nearly the whole, of his mental food chewed and digested for him, to the pupil teacher who sat down at half-past six every evening and rose at ten or half-past, having only just completed his daily task like the mill horse which tramped his monotonous round, and the student of the training college who might lose the Saturday half-holiday if the full tale of bricks had not been delivered.

It amounted to a positive gain to a small class of the Seventh Standard scholars if, instead of being dragged into all the lessons of the Sixth Standard, they were allowed to **study by themselves**, and ask for help only when they needed it. Surely, therefore, it was an excellent subject for consideration how the habit of self-activity or self-help might be created, **without which any real acquisition of knowledge became well-nigh impossible.**

A tail of backward scholars might always be expected to every class, but whereas it used to be a tail of uniform size, a tail of despair in more senses than one, it was now a natural tail gradually tapering off according to natural ability. In the periodical examination the class should not be judged by the tail; in assessing the work of a class, a group of papers should be taken from the upper part of the class and another group from the middle, but none from the lowest, and for two reasons, (1) they were no real criterion of the teaching; (2) each of these papers should be carefully considered with a view to ascertaining the individual character, for the causes of failure would be found to be different in nearly every one of the lowest members of the class.

Probably one of the best means at the teacher's disposal, with the older scholars at least, is the giving of home lessons, but as their value is a disputed point it will be just as well not to rely on them solely (see *Classification*, page 43). Silent Reading, independent working in Arithmetic from books or cards, the use of text books or class reading books for the purpose of individual preparation or revision, original composition, and other school subjects may all be utilised. But the greatest aid will be to import that "kindling of the spirit of human life and thought, to give a living interest to the teacher's words, and a force and colour to the lesson". The habit of work has to be formed, and to do this successfully the teacher must understand both the nature and training of habit (see page 34). The child's activities must be constantly utilised and guided, and a fair share of work should always be thrown upon him. The school curriculum now admits of plenty of opportunity for forming pleasant associations with work, and it must be the teacher's aim to see that this association is so strong that there will be no desire to break it when school days are over.

## OBJECT LESSONS.

**THE METHOD OF WRITING THEM.**

Object Lessons may be written in a variety of forms, and indeed such variety will always be desirable, as it would be neither wise nor profitable to treat every object in the same stereotyped way. Generally, the **Matter and Method Form** prevails, as both practice and facility favour it. But students and teachers are advised to adopt the **Training or Logical Form** where the nature of the subject matter will permit it. The following *advantages* are claimed for it:—

1. It enables the teacher to show more clearly the **logical arrangement** which ought to characterise these lessons.
2. It enables him to give more prominence to the **training** aimed at, and to strongly mark the **inductive nature of the lesson**.
3. More prominence can be given to those **experiments** and that correct use of **observation** on which the value of these lessons depends.
4. It draws attention to the "**results**" of these experiments and observations, and registers them in the language of the children themselves.
5. It shows the teacher's method of ensuring the active **co-operation** of the class and of arousing **interest**.
6. It reveals "the association of one lesson with another through some one leading idea or ideas"; e.g., Drawing, Composition, Kindergarten, Suitable occupations are all utilised and associated.

In most lessons the notes will be written in three parallel columns, the nature of which will be obvious from the study of the subjoined specimen lesson. The method lends itself readily to lessons on Common Objects, to some lessons, with a little modification, on Animals, but to fewer lessons on Plants. Such Physical Geography Lessons as those on *Clouds, Rain, Dew, a River*, etc., also do not adapt themselves easily to it. Speaking generally, the form is best suited to **Experimental Lessons**, where Experiment is the chief teaching aid employed, and where, as a consequence, Cause and Effect can be easily shown.

Now in lessons on Animals, although plenty of scope is afforded for Observation, and some scope for Experiment, there is but little opportunity of illustrating Cause and Effect, hence a slight modification is required. The first column is headed *Observation and Experiment*; the second, as a rule, *Results*; the third, *Inferences*. The modification required here is the substitution of *Remarks* for *Results*, not only for the reason just mentioned, but also because every lesson on an Animal involves the imparting of some information (which should be tersely placed in the *Remarks* column) to help out the *Observations* made, and to lead to the *Inferences* desired.

The chief mental profit to be got out of a lesson on a Plant is the **cultivation of the power of observation**; the chief moral gain is the **implanting of a love of nature**. Here again, Experiment, and Cause and Effect are not the chief aids employed, because they are often not available. But what is lost in Experiment is probably gained in increased Observation, in the outdoor preparatory work required for some of these lessons, and in their good emotional value. The full form may sometimes be used, as in a lesson on *How Plants Grow*, or on *How Seeds Grow*; sometimes the middle column is advantageously omitted, as in a lesson on *Plants as Growing Things*, or on *Vegetation and Cultivation*; sometimes the form is inapplicable, as in a lesson on the *Veins of Leaves*.

The *Inferences* should always be written in larger type than the rest of the lesson, or they should be underlined, or distinguished in some way

to indicate their importance. For each step in the lesson each inference respectively constitutes the goal which the class is trying to reach under the guidance of the teacher.

A specimen lesson (taken from *Garlick and Dexter's Object Lessons*) is now given:—

### IRON.

**Things Required.**—Nails, hammer, poker; pieces of iron and wood of equal size; water; iron rod and piece of glass tubing about same diameter; heavy weights; iron and lead tubing of about same diameter; fire, sheet iron, iron wire, piece of rusty iron, lead, iron spoon, magnet, penny, shilling, iron filings, sand.

Observations and Experiments.	Results.	Inferences.
1. (a) Let child hold piece of iron and wood of same size. (b) Drop each into water.	Iron harder to hold up than wood. Iron sinks; wood floats.	Iron is heavy.
2. (a) Let child scratch wood with iron nail. (b) Drive nail into piece of wood; pull nail out and examine.	Wood easily scratched. Nail not altered, but hole has been made in wood.	Iron is hard.
3. Rest iron and glass rods on two supports; hang heavy weights on parts of rod between the two supports.	Glass rod breaks; iron rod does not break.	Iron is strong.
4. (a) Get child to try to bend iron and lead tubing. (b) Put poker in fire till end is red hot; press hot poker sideways on hearth.	Lead tubing bends; iron tubing does not bend. Poker easily bent.	Iron does not bend when cold but bends when hot.
5. (a) Get child to strike piece of iron wire with hammer. (b) Make wire red hot; strike it with hammer. (c) Show specimens of sheet iron and iron wire.	No effect is produced on iron. The iron wire is flattened.	Iron can be hammered out when hot, but not when cold. It can also be made into wire.
6. Melt lead in iron spoon.	Lead melts; spoon does not.	Iron does not melt easily.
7. Show piece of iron that has been exposed to air for a long time.	Iron is covered with brown scales.	Air rusts iron.
8. (a) Try to pick up nail, penny, shilling, lead, etc., with a magnet. (b) Separate iron filings from sand by means of a magnet.	Magnet only picks up the iron.	Iron is the only common thing a magnet will pick up.

Oral Composition to follow.

**B.B. Sketch :—Iron**

- Is Heavy, hard, strong.
- Can be bent and hammered out into sheets.
- Can be drawn out into wire.
- Does not melt easily.
- Rusts in air.
- Is picked up by magnet.

## KINDERGARTEN.

**INSTRUCTION OF INFANTS.**—The Department is desirous of giving further encouragement to the employment of *Kindergarten* methods.

The circumstances of infant schools have altered considerably in the last few years; the numbers in the lower classes having increased, a full four years' attendance at the infant school will be the rule and not the exception. The improvement also shown in passing the Standards at an earlier age than formerly gives to infant schools greater liberty and leisure in developing natural methods of education.

As regards the *Elementary Subjects*, the conditions of the Code are fully satisfied if the scholars over seven can pass, as a rule, in the First Standard; nothing more should be attempted in these subjects in the infant schools, except in the few cases in which scholars are allowed to be retained for the work of the Second Standard. The scholars in the lower classes of infant schools may, therefore, be relieved from any premature preparation for those subjects on methods ill-suited to their tender age.

**Two leading principles** should be regarded as a sound basis for the education of early childhood :—

1. **The recognition of the child's spontaneous activity**, and the stimulation of this activity in certain well-defined directions by the teachers.
2. **The harmonious and complete development of the whole of a child's faculties.** The teacher should pay especial regard to the love of movement, which can alone secure healthy physical conditions; to the observant use of the organs of sense, especially those of sight and touch; and to that eager desire of questioning which intelligent children exhibit. All these should be encouraged under due limitations, and should be developed simultaneously, so that each stage of development may be complete in itself.

It has been strongly urged that sufficient attention has not been paid in the past to these principles; indeed, it is so often found that the *Kindergarten Occupations* are treated as mere toys or amusing pastimes, because they are attractive for children, and the intellectual character of the "Gifts of Froebel" is disregarded, whereas *the main object of these lessons is to stimulate intelligent individual effort.*

The attention of teachers should be directed to the chief consideration which underlies true methods of infant teaching, *viz.*, **the association of one lesson with another through some one leading idea or ideas.** *The reading lessons, occupations, and object lessons may all be usefully combined for one purpose; e.g., if the teacher wishes to impress on her class some knowledge of a domestic animal, she may usefully combine the object lesson for general study of its structure; the reading lesson for a knowledge of its habits and character; some occupation, such as pricking the*

outline, to impress an exact knowledge of its form ; a song or simple story bearing on its association with human life ; so that familiarity with animals, especially with domestic animals, and a kind treatment of them may be fostered.

On the other hand, teachers should guard against the mere repetition of the same exercises and lessons; the progressive character of the whole scheme of instruction should be constantly kept in view; and each exercise should lead up to something beyond itself.

*Pictures and flowers* have been wisely introduced of late in greater abundance into infant schools and have added much to their cheerfulness and attractiveness. *They should be frequently taken down into the class and made the subject of conversation.* It is not enough that the children should be taught to observe these things and to answer questions upon them. They should be encouraged in every way to give expression in their own words to what they know, what they want to know, and what they think.

**It will be found that the Elementary Subjects when taught on right methods can be treated with greater variety; reading becomes a Kindergarten lesson through pictures and word building; writing becomes a variety of Kindergarten drawing; elementary exercises in number are associated with many of the Kindergarten occupations.**

It is the experience of many good teachers that by the adoption of such methods it is found to be unnecessary before the sixth year is passed to employ books for Reading, except occasionally for a change of occupation, or perform any exercise in Writing except the elements of letters, or to do any formal Arithmetic work on slates.

It may reasonably be hoped that the observance of these suggestions will materially improve the work of the younger children in infant schools and classes by relieving the teacher from that useless subdivision in the elementary subjects which has been hitherto generally employed, and by rendering the instruction less formal, but more varied and attractive.—*(Circular 322.)*

### **SUITABLE OCCUPATIONS.**

Kindergarten occupations have for some time been used in our infant schools, and manual instruction has also been given to the elder boys in many schools for older children, while the elder girls have similarly been taught cookery and laundry work; but the scholars in the first, second, and third standards have, as a rule, had hitherto no manual training, except in so far as it has been supplied in the forms of needle-work and drawing. Manual instruction is a valuable part of school training, and my Lords desire to encourage managers of public elementary schools to introduce, where circumstances permit, a suitable course of manual occupations for the three lowest standards.

Kindergarten occupations as used in the infant school are not suitable for the children in schools for older scholars. The mat-weaving, stick-laying, embroidery, tablet-laying, and building with bricks or cubes, which serve to give young children ideas of form and number, as well as to train hand and eye, seem trivial to the ordinary child of nine or ten years of age. On the other hand, few of the common workman's tools can with safety be put into the hands of ordinary children under the age of eleven.

**An Occupation ought to satisfy several conditions.**

- (a) It must be *educative*, and should especially *stimulate independent effort and inventiveness*. Any work that provides a real training for hand and eye is in a true sense educative, but **the most valuable work of all is that which imports a knowledge of form, colour, and the properties of materials, at the same time that it fosters manual dexterity.**
- (b) It should admit of being dealt with in a *progressive course*.
- (c) It must be *attractive* to the children, and afford a welcome relief to other studies.
- (d) It must *not involve the use of needlessly expensive materials*.
- (e) It must be capable of being practised in an ordinary schoolroom, *without risk of harm to children or damage to furniture*.
- (f) It must, in cases where the classes are as large as the Code permits, be *so simple* that it does not require an undue amount of individual attention. Large classes should, where possible, be subdivided for these occupations.
- (g) It should *avoid a long series of preparatory exercises* apart from finished results, and the finished article should be one that is *attractive to a child*. At the same time *the construction of articles for sale is undesirable*.

The manual occupations satisfying these conditions which have been most commonly adopted as **specially suitable for the First, Second, and Third Standards** are:—

1. Modelling in clay.
2. Modelling in cartridge or cardboard paper.
3. Cutting out in paper or other material.
4. Drawing and colouring designs (some original).
5. Brush drawing from the object and from recent impressions.

Other equally useful occupations may, no doubt, be devised, and any occupation that is proposed, if it is likely to prove satisfactory, will be readily accepted by the Department.

It appears that the various manual occupations which have hitherto been introduced for the lower standards because of their suitability resolve themselves into exercises in the studies of (1) **form**, (2) **colour**, (3) **measurement**, which should be, where possible, *connected with other subjects of instruction*.

**For acquiring a knowledge of form the most effective occupation is Clay Modelling.** It demands *accurate observation* of the object which is chosen as a model, and *the accuracy of the observation will largely depend upon previous instruction as to the build or growth of the object in its natural state*. Sometimes a lesson on *Modelling* has followed one on *Natural History or Science*; sometimes the children, after an *Object lesson* upon the formation of a fruit or the germination of a seed, have modelled the object, thus at once testing the correctness of their impression and driving it home. *Clay Modelling* has been used to illustrate the *Geography* lessons; for example, the children construct a model of the river basin in which they live; and, again, illustration has been found for the *History* lesson in constructing a model of some neighbouring encampment, whether square or circular, Roman or British. *As a knowledge of form depends upon a close observation of light and shade, a lesson in modelling greatly furthers instruction in drawing.* Clay Modelling, however, lacks the charm of colour.

**Colour may be studied in the following ways:** When care is taken to provide a variety of tasteful shades of coloured paper, it is possible to *combine the drawing, cutting out, and mounting of a number of good*



designs, many of which may be, in respect both of pattern and arrangement of colour, the original work of the children themselves. The drawing may be done partly by aid of rulers and templates, and partly free hand. The use of templates makes it possible to stamp on the mind certain beautiful curves at an earlier age than children can draw them freehand. This kind of exercise has been very fully developed by some of the officers under the London School Board. The *advantages* of it are that it *promotes accuracy and good taste in colour and design, and also a sense of harmony and proportion*. The defect of it is that *the manipulation is somewhat monotonous, and that it does not lead to much increase of knowledge of varied objects*.

**Brushwork** demands a clear perception of form and some knowledge of natural objects and cultivates delicacy of touch, but it does not train the student to great accuracy or cultivate the sense of colour. Children, however, can express their impression of a flower, as for instance a bluebell and its leaves, much more easily by the brush only than by the pencil, and if their observation has been very inexact, the error becomes obvious when they try to draw their impression.

**As an exercise in accurate measurement, Cartridge Paper or Card-board Modelling** leaves little to be desired. This work is an excellent training in exact measurement and in cutting true to measure, and it furnishes an elementary notion of construction. The manipulation, however, in this exercise also is somewhat monotonous. This kind of work lends itself readily to the illustration of instruction in simple geometry. The beginner may learn to cut out in cardboard (or more readily still in stout drawing-paper) simple plane geometrical figures, and after a time he may proceed to simple geometrical solids. The cube, the cone, the cylinder, the wedge, the prism and the pyramid can all be drawn, cut out, and put together without much difficulty. The manufacture of various useful articles, such as blotting-books, frames, trays, and the like, can be combined with the formation of geometrical figures.

As no one of the branches of manual occupation is complete when taken by itself, the most satisfactory results will follow where it is found possible to make them supplement each other.

Lastly, very great care is necessary in leading the pupils to acquire correct method in handling brushes, tools, and all the implements required. Another point which demands attention is that of the general posture of children during their lessons. Where much stooping is necessary, the work should be occasionally interrupted and a short extension drill given. Unhealthy and cramped postures should be avoided. Whilst fairly accurate work should be aimed at, beware of expecting very fine work requiring minute finish, or any work which is likely to strain the eyesight of young children.—(*Departmental Circular*.)

**INFANT SCHOOL GAMES.**—See pages 79 and 80, *Play and Dance*.

**1. Physical Advantages.**—Children seem to live for play. They delight in bodily activity, and their active instincts find constant outlet in movement. Their happy, unregulated play, although without definite aim, is an important element in their development. Their young and ever-growing bodies find further growth and development through their games. The muscles are developed and improved, the circulation is quickened, effete matter is carried off, health is improved, and every organ of the body is rapidly nourished. In the training of children, whether physically or otherwise, the best principle to go on is natural growth, and this is

only learnt by careful observation and study of children. Children are too young to share the gymnastic training of their elders, but organised and regulated games offer an efficient substitute, and are better calculated to make their young bodies and limbs supple and active. **By their aid an immense amount of hand and eye training is imparted through the pleasurable medium of play.** *The love of power and the pride of success* are fostered by their consciousness of skill. **The games, rightly treated, are an expansion of the educative effects of the occupations,** for the same notions are given and the same associations are formed, although in a different form. The same educational method runs through all alike.

**2. Mental Advantages.**—The forms of play are innumerable, but to the observant teacher something is to be learnt from all. **Nothing gives such a true revelation of child character as child play,** and no branch of child life affords better opportunities to the teacher for profitable work. Children dearly love to be noticed by older people and to share their games with them, if only they are assured of their sympathy. Then comes the teacher's opportunity. Organised games must have rules, and these rules can be laid down and enforced on a pleasant basis. Custom, age, position, strength, and higher authority all assist. The child shares in a well-ordered game, and so gradually is brought under the influence of new ideas and feelings. **In this way he receives his first "social" ideas.** He learns to subordinate himself to the common needs and the common good. He receives a pleasant object lesson which helps him unconsciously to grasp the fact that he is only a unit of the whole body. **He learns to combine willingly and regularly with others,** and this is all done in a practical way. The child could not learn the same truths verbally, for they would be beyond his comprehension, and so, in an easy and acceptable way, knowledge is given, and an invaluable association is set up. "The associations that are to govern life must have small beginnings if we would root them early, and they must be rooted early if we would root them deep." It is easier to bend the pliant twig than the stubborn stem. The little child has only to learn; the neglected child has much to unlearn.

**INFANT SCHOOL SONGS.**—See pages 80 and 316.

Whilst the ordinary school song, among other things, is useful as *a recreative and restful change* between other lessons, the infant school song, with its Kindergarten attributes, is something more. The child's *love of activity and mimicry* is fully and wisely indulged. *The words of the song* draw attention to scenery, to objects well known to him, to natural phenomena, to common animals, to human labour, and to various kinds of people. His *interest in life* is thus widened, his *sympathies* cultivated, and **his taste is improved.** *Pleasant associations* are thus formed between work, order, government, and pleasure, which are to bear more or less desirable fruit in the future. Many songs of this kind are now published—action songs—and probably every infant school teacher is more or less familiar with some of them.

**Selection of Songs and Games.**—No attempt is made at selection in either case here. The field of choice is so wide that there can be no difficulty in the matter. Every school will have its own selection made, and the pupil teacher will be able to see that selection put into practical use. But the following suggestions are thrown out as being useful, probably, for examination purposes.

(a) **Action Songs.**—A list of about half-a dozen should be made,

learned, and *taught* to the children by the young teacher if possible. If not, the teaching and rendering of them should be carefully watched and noted, the actions studied, and the general characteristics remembered. The list, with the actions intelligently written out, should then be entered in a note book for future use.

(b) **Indoor Games for Infants.**—Game and song are most often combined. If there is any distinction worth making in such cases, it is that in the songs the singing is the dominant factor, while in the games play is supreme. The student is advised to pursue the same course as with the action songs. Such "Movement Plays" as may be found in several well-known books will be very suitable, and about half a dozen should be prepared in the same careful way as the songs.

(c) **Playground Games for Infants.**—In suitable weather many of the "Movement Plays" lend themselves admirably to out-door work, and a further list, more specially suitable for this purpose, should be prepared as in the previous cases. In addition, any local or popular game should not be despised. Any form of play which lends itself to organisation and is liked by the children should be utilised. What these games may be each district will best decide for itself, but here again a careful description of a few should be written out and preserved with a view to examination necessities.

(d) **Playground Games for older Scholars.**—These might include *Drill* (see page 5), and some of our *popular games* (see page 6, *The Teacher's Work*). Both *cricket* and *Association football* could be played with a small, soft ball. *Shuttlecock* and *battledore*, *skipping*, and even *hop-scotch* (in asphalted playgrounds) could be played by the girls, while such old games as *French tag*, *the mulberry bush*, and *oranges and lemons* would bring variety. The *tug-of-war* needs little outlay, is a good game for boys, and is even played in some girls' and infant schools. *Tennis* requires capital and can only be played by a few of the elder ones at a time, while few playgrounds attached to elementary schools are fitted for such public school games as *fives* or *rackets*—the more's the pity. *Leap-frog* is popular with some boys, but physical weaklings should be excluded. *Jumping* is not often possible in the playgrounds of town schools, but may be practised where the surface of the playground safely admits of it. *Foot racing* is possible in many playgrounds, and the teacher might encourage it among the "sound" boys by carefully framing handicaps, and occasionally offering a small prize of some sort. Many other games will readily suggest themselves, but whatever they may be, before adopting them, the teacher should see that they are not only pleasurable, but beneficial and educative. For these reasons, **any game involving the element of gambling, cruelty, or destructiveness should be avoided**.

**Teaching.**—See page 328, *How to Teach a School Song for Young Classes*. In addition to what is said there, it must be noted that the actions will be learned by *pattern work*, action by action, on the part of the teacher, and by *imitation* on the part of the children. Too much should not be attempted in one lesson, but the quantity must always depend upon such factors as the amount of time available, the ability and energy of the teacher, the nature of the song, and the grade of the class.

In teaching a *new game*, there should first be a simple *description* with *practical illustrations* so far as these may be given by the teacher himself. *A few of the most apt children should then be instructed*, guided, and practised in the game in the *presence of the rest of the class*, who will be directed to watch attentively. When these children are efficient, the teacher

then has so many *assistants* to distribute at different points, and *another batch of children should be introduced*, but no more than are fairly manageable by the teacher and his young staff. **The idea is to avoid confusion or failure.** The game must be presented in its best light to win the approval of the children, and no association of muddle or silliness must cling to it. **Children are keen but hasty critics of games.** Unless the game goes smartly and well, they will give an unfavourable judgment at once, which the teacher may find a difficulty in removing. When the number of children knowing the game is sufficient to provide all necessary assistance, then the whole class, and in a similar way, finally the whole school, may come under active instruction and participation.

## ARITHMETIC.

### NOTATION.

Young children can be made to understand our system of Notation so far as its base and composition are concerned. They can be taught the meaning of "**Local Value**" as distinct from "**Intrinsic**" or "**Absolute Value**". They can learn that the base of our system is 10, and they can be shown how that base works into the composition of numbers. They may even easily comprehend **Index Notation** and the number of figures required to express our decimal or denary system. But when it comes to bases greater or smaller than 10, and to the demonstration of the advantages of the ten-base over any other, it will be better to postpone the necessary explanation to a later Standard. These things are the better understood when **Scales of Notation** are known, and although the actual working of the few simple examples required for the purpose in hand is probably within the grasp of the average young scholar, still the *reason* for that method of working would be better appreciated by a more mature mind.

**1. Local Value.**—First get the children to understand what is meant by this term, and proceed as follows:—

Write down any number—22302—on the B.B.

Class to note that the figure 2 appears 3 times.

Beginning from the right—

The meaning of the *first* 2 is 2 *units*;  
 „ „ *fourth* 2 is 2 *thousands*;  
 „ „ *fifth* 2 is 2 *ten thousands*.

The class then infers that, in consequence of a change of position, a figure may have a change of value, *i.e.*, the place or locality of a figure fixes its value, and this is called its **Local Value**.

**2. Intrinsic or Absolute Value.**—But the figure 2 always represents 2 somethings, whatever its position may be, and it never represents anything else but 2 somethings, *i.e.*, from this point of view its value is a quality of itself, and is unchangeable. This is called its **Intrinsic or Absolute Value**.

**3. Index Notation.**—With the aid of the B.B. get class to note:—

$$\begin{array}{ll} 10 = 10 \times 1 & = 10^1. \\ 100 = 10 \times 10 & = 10^2. \\ 1000 = 10 \times 10 \times 10 & = 10^3. \\ 10000 = 10 \times 10 \times 10 \times 10 & = 10^4, \text{ and so on.} \end{array}$$

From an examination of these and other cases, if necessary, the class

should be able to tell the teacher that the little figure in each case points out how many times 10 is multiplied by itself to produce either of the given numbers. The name of the little figure can then be given them, and the suitability of its name for the work it does can be illustrated by a reference to the *pointing or index finger*, and to the place and functions of the *index of a book*.

The class will now be in a position to comprehend the **Index Notation** of any given number, and to see how that number is built up, *e.g.* :—

$$\begin{aligned} 22302 &= 20000 + 2000 + 300 + 2. \\ &= 2 \times 10000 + 2 \times 1000 + 3 \times 100 + 2. \\ &= 2 \times 10^4 + 2 \times 10^3 + 3 \times 10^2 + 2. \end{aligned}$$

The number 10 which is seen to be a factor of every product or number except the first (2) is called the **base** or **radix** or **root** of the Scale of Notation.

**4. Number of Figures Required.**—Get the class to note that we only have the following figures :—

1, 2, 3, 4, 5, 6, 7, 8, 9,

*i.e.*, for a system or notation whose base is 10 we require 9 different figures, or, counting the cypher (0), we require 10 symbols. But any other figure might have been chosen as a base, as 2, 3, 4, 11, 12, etc., and then the scale would not have been Decimal or Denary, but

For 2 it would be called Binary ;

" 3 " " Ternary ;

" 4 " " Quaternary ; and so on.

Suppose the base to be 7 instead of 10. Then only 6 figures and a cypher will be required, which fact should be stated by the class and not by the teacher. The system of Notation will be the same until we reach 7, when it differs. In this scale 7 would be represented by the figures 10. A comparison may help the class to understand this :—

Scale of 10.

Scale of 7.

1	would still be	1	
2	"	2	
6	"	6	
but 7	would now be represented as	10	<i>i.e.</i> , one 7 + 0.
8	"	11	" one 7 + 1.
9	"	12	" one 7 + 2.
14	"	20	" two 7's + 0.

It will thus be seen that no more than the 6 figures and the cypher are required. Similarly :—

A scale of 2 would require 1 figure only ;

"	3	"	2	"
"	4	"	3	"
"	20	"	19	"

*i.e.*, the number of figures required for the notation of any scale is always 1 less than the number indicated by the base, or, counting the cypher as a figure, the number is always the same as that represented by the base.

## NOTES OF A LESSON ON SIMPLE INTEREST.

**I. Introduction.**—Give a few examples of which the following are specimens: (a) A man hires a bicycle at 5s. a day, and at the end of the day returns the bicycle and the cost of hire. Here money is paid for the use of the bicycle. (b) One man lends another £1 for a month on the understanding that the borrower is to pay £1 1s. at the end of the month. Here 1s. is paid for the loan of £1 for one month. Deduce: Men hire things (or borrow money) from other men and pay money for the use of the thing hired (or for the use of the money).

## II. Introduction and Explanation of Terms.

1. *Principal, Interest, Amount.*—Write an example like (b) on the B.B.; draw attention to the sum lent (Principal) and the money paid for the use of money (Interest). "Amount" might be dealt with in a similar manner. Then practise the class in picking out the Principal, Interest and Amount from examples given.
2. *Per Cent.*—The draper sells calico by the yard, the grocer sugar by the pound. Each has his standard. The standard of the moneylender is £100. From the meaning of century, centurion, etc., deduce that *cent.* means 100. Thus *per cent.* means by or for a hundred.
3. *Per Annum.*—The man in I. (a) would have to pay more for the hire of a bicycle for a week than for a day. Similarly, more must be paid for the loan of £100 for two years than for one year. Hence a standard of time is necessary—the year. Introduce term *per annum*. Compare with "annual".

**III. The Working of Examples.**—These should be worked mentally—easy cases being chosen—and on the B.B. The class should then be practised in easy but graded examples. These examples should be worked by the Method of Unity, and to give some aid in style, the children should be allowed to transcribe an example from the B.B. in their note books.

**IV. Rule for Calculation of Simple Interest.**—From the examination of examples worked, get the class to see that in each case the principal, interest and time have to be multiplied together and the result divided by 100.

**5. Advantages of the Common or Decimal Scale.**—The pupils should now be able to give the advantages of our system with its base of 10, which probably had its origin from the practice of counting on the 10 fingers.

- (a) The system, being a decimal one, is **probably easier than any other**. Some people dispute this, and say that with equal practice we could have written and calculated with equal facility on other bases.
- (b) *A smaller base* would have the advantage of requiring fewer symbols, but this would have been more than outweighed by the **extra number of places of figures required** to express the larger numbers. This increase would make both Notation and Numeration more difficult.
- (c) *A larger base* would have required **more figures**, and more figures, both in the learning and manipulating of them, would again have been more difficult.
- (d) It is the base of the system **used by other civilised countries**. This last advantage could be told to the class and explained.

## THE METRIC SYSTEM.

### I. Revised Instructions.

The Code provides that scholars in the Fourth and higher Standards shall be taught in the principles of the **metric system**, *i.e.*, on the convenience of adopting systems of coinage and of weights and measures in which **the increase of values or of quantities proceeds by multiples of ten, and their diminution by tenths**. So long as these principles are grasped, it is immaterial whether instruction in the system is illustrated by the French metre, with its subdivisions and multiples, or by some other unit. But it will probably be found most convenient to illustrate them by reference to the *metre* and the *franc*. The *metre* can be readily compared with the English yard, and its approximate length can be easily remembered if it is taught in the form of 3 ft. 3½ ins., in which the number 3 is alone employed.

It should be borne in mind that a **real knowledge of all weights and measures can only be obtained by allowing the scholars to handle and use them**.

### II. The Chief Unit of the System.

The originator of the Metric System was Watt of steam engine fame, who unsuccessfully urged its adoption in England. It was taken up in France at a later period. The system attempted to get a *natural* unit as a basis. For this purpose a quarter of a meridian (AB) was taken and divided by 10,000,000, and the quotient was made **the unit of length**. This quotient was called a **metre**, and, roughly speaking, it is 3 ft. 3½ ins. long. **Everything is built up from this unit**. The accuracy of the measurement is not now universally accepted, so that the standard unit must be considered an *arbitrary* one, although it is none the worse on that account,

**III. Length.****1. Outdoor Work.**

- (a) Measure 1 **metre** in the playground or along a near and suitable road.
- (b) Extend the line 10 times its length. This measurement is called a **decametre**.
- (c) Measure 10 decametres along the road. This is called a **hectometre**.
- (d) Measure 10 hectometres along the road. This is called a **kilometre**.
- (e) See that the association between the name and the measurement is well fixed.
- (f) Do not yet bother about the derivation and meanings of the respective prefixes.

**2. Class-room Work.**

- (a) On B.B. draw a line, 3 feet  $3\frac{1}{4}$  inches in length—equals 1 **metre**.
- (b) Divide it into 10 parts. One part equals a **decimetre**.
- (c) Now divide a decimetre into 10 parts. Each part is called a **centimetre**.
- (d) Divide a centimetre into 10 parts. Each part is called a **millimetre**.
- (e) As in outdoor work.
- (f) Explain the meaning and force of the prefixes used. It will be useful for the steps that follow.

**3. Compile the Table.**

This should be done by the class, starting with the metre. Myriametres may be omitted. Express all in metres.

10 millimetres	= 1 centimetre	=	'01 metres.
10 centimetres	= 1 decimetre	=	'1 "
10 decimetres	= 1 metre	=	1 "
10 metres	= 1 decametre	=	10' "
10 decametres	= 1 hectometre	=	100' "
10 hectometres	= 1 kilometre	=	1000' "

From this compilation the class should note:—

- (a) It proceeds by multiples and sub-multiples of 10.
- (b) As a consequence it is an application of the decimal system.
- (c) It utilises our system of Notation for the Simple Rules, and saves the burden of learning the fresh Notations of the Money, and Weights and Measures Rules.

Finally, the *English equivalents* should be learned and the class should be well drilled in them. The aid of *Drawing* should be enlisted, and the class exercised in drawing the multiples and sub-multiples *to scale*.

**4. Examples.**

Similar examples should be worked by both methods, and placed side by side on the blackboard. Two facts will at once be apparent to the class:—

- (a) The simplicity of the Metric System.
- (b) The similarity of the work to that in the Simple Rules.

**IV. Square Measure.****1. Outdoor Work.**

- (a) Measure 10 metres in the playground.
- (b) From one extremity of the line measure another 10 metres at right angles to the first line.
- (c) Complete the Square. This is called an **Are**, and is the unit of Square Measure.

If the playground is asphalted, mark the measurements with chalk. If not, fix pegs, or place boys at the corners.



## 2. Class-room Work.

Supply the children with proper drawing apparatus. This work is to be done by the class—to scale. The scale chosen will depend upon the size of the slates or drawing-paper supplied to the children. The teacher should work with the children, to a larger scale, on the B.B.

- (a) Draw any straight line of suitable length. Let this represent 10 metres. Complete a square with this line as a side. This represents the **Are**.
- (b) Divide 2 adjacent sides into 10 equal parts each, and through the points of intersection draw lines parallel to each side respectively.
- (c) Count the squares. There are 100, and each one presents a square metre.
- (d) Then any one of these small squares is  $\frac{1}{100}$  part of the whole square. Hence it may be called a Centiare square or a **square centiare**.
- (e) *Note there is no deciare.* Class to give reason.
- (f) Teach the **hectare** in the same way, and let the class note that there are *no decares*. Reason again to be given by class.
- (g) **Compare** and **illustrate** with formation of English Square Measure.

## 3. Compile the Table.

To be done by class again. By the use of similar diagrams the other measurements can be shown to be related to each other. The multiple is seen to be, not 10, but  $10^2$  or 100.

1 centiare	=	1 square metre.
100 centiares	=	1 are.
100 ares	=	1 hectare.

## 4. Examples.

- (a) Similar examples should again be given to show the facility with which this system is worked.
- (b) In working examples the terms *decare* and *deciare* may be met with. Tell the class that they represent 10 ares or  $\frac{1}{10}$  are respectively.

## V. Cubic Measure.

1. Get 12 slender sticks or pieces of wire each 1 metre long, and construct a large skeleton Kindergarten tube. It will be better still if done in cardboard, as the element of solidity will then be apparent. This is the unit, and is called a **stere**.

2. Draw a diagram on the B.B. to represent a cube with a 10-millimetre side. Draw parallel lines through each of the millimetre divisions. Use coloured chalks or shade alternate lines of cubes so as the better to bring out the idea of layers of cubes.

3. Let the class count the top layer—100.

4. Then let them count the number of layers—10 with 100 cubes in each.

5. Then ask for the total number of little cubes—1000, i.e.,  $10 \times 10 \times 10$ , or  $10^3$ .

6. Compare with the English Measure, e.g., 1728 c. ins. is  $12 \times 12 \times 12$ , or  $12^3$ .

7. Build up the table:—

1000 cubic millimetres	=	1 cubic centimetre.
1000 " centimetres	=	1 " decimetre.
1000 " decimetres	=	1 " metre = 1 stere.

8. Tell the class that higher denominations than the **stere** are seldom used.

**Examples.**

Work similar examples again in both systems on the B.B. and side by side. Class to note:—

1. To reduce from any given denomination to next lower denomination *multiply* by 1000.
2. To reduce from any given denomination to the next higher *divide* by 1000.
3. That all the work involved can be done by simply moving the decimal point 3 places to the right or left.

**VI. Capacity.**

Proceed as in Cubic Measure:—

1. Make a cardboard cube with a **one-decimetre side**. The inside volume of this cube equals a **litre, which is the unit**.
2. Show a vessel (decanter, jug, etc.) which is a litre measure. Then show an English quart measure.
3. Fill the litre vessel with water; transfer to quart measure. Class observes that the litre is somewhat less than a quart.
4. Construct table as in Cubic Measure.

1000 cubic centimetres = 1 cubic decimetre = 1 litre.  
1000 litres = 1 kilolitre (about 220 English gallons).

**VII. Weight.**

1. Make a small cardboard cube with **1 centimetre side** (inside measure). Tell the class that a measure of that size is filled with distilled water at 39° F., and that the weight of water contained is called a **gramme** (the unit).
2. Explain the reason for the use of *distilled* water (to be free from impurities which might cause the weight to vary), and of the fixed temperature (temperature at which water reaches its greatest density).
3. Pass round a gramme weight (there should be one in the school museum) for the class to judge of its relative weight.
4. Build up the table. Roughly a gramme equals  $\frac{1}{16}$ -oz. Avoirdupois.

1000 grammes = 1 kilogramme (about 2½ lbs.).  
1000 kilogrammes = 1 tonneau (not quite an English ton).

5. Work examples, **compare** the systems, and give the class exercises as in the other tables.

**VIII. Money.**

1. Show a **franc. This is the unit**.
2. Weigh it before the class, if possible; if not, tell them that it weighs 5 grammes.
3. Tell also that  $\frac{9}{10}$  of it is silver and  $\frac{1}{10}$  alloy.
4. Tell that

10 centimes = 1 decime } show specimen coins;  
10 decimes = 1 franc }

and that **only francs and centimes are considered in keeping accounts**. The decime is the French penny. The French halfpenny is called a *sou*, and in the everyday life of the people one hears much more of sous than decimes.

5. The same kind of practical work should follow as in the previous cases.

**IX. Hints and General Principles.**

From what has now been briefly explained, the young teacher will be able to summarise the following general principles and hints to guide the teaching of this subject:—

1. The increase of values or quantities proceeds by multiples of 10, and their diminution by 10ths, *i.e.*, it is an application of the decimal system.

2. All the Tables centre round one common unit—the metre, *e.g.* :—

Name of Table.	Unit.	Connection with Common Unit
Length	Metre	
Square Measure	Are	100 square metres.
Cubic Measure	Stere	1 cubic metre.
Capacity	Litre	1 cubic decimetre.
Weight	Gramme	1 cubic centimetre.
Money	Franc	5 grammes = 5 cubic centimetres.

3. The metre being given, it should be practically demonstrated how each other table is derived from it.

4. The association between the name and the measurement should be well fixed, the name being learned from the measurement, and not conversely.

5. The multiplying force of the prefixes used should be allowed to grow upon the class before either derivation or explanation is utilised.

6. The scholars should build up their own tables from the practical demonstrations which they see and share.

7. The great aid of *comparison* and *contrast* should be freely used to firmly fix the association between the terms used in the two systems.

8. Similar examples from the French and English systems should be worked side by side on the B.B. to show the superior simplicity and facility of the Metric System.

9. Exercises should be given to test the correctness of the knowledge of the class, and these exercises should receive vitality, force, and local colour by assuming the form of local business and shopping transactions.

## READING.

**The Type-Word Method.**—This is an analytic-synthetic type-word system of reading combined with the Phonic Method. It is an Australian system, and is in use in the primary schools of South Australia. The “*Adelaide*” illustrated primers which embody the system are published by the Education Department of that colony, which thus stamps the method with official approval.

I. In the beginning the following limitations are imposed :—

1. Only such words as are **names of real objects** are used.
2. The children must be **familiar** with these words.
3. The objects must be such that a **conversation** can be held about them.
4. The objects must also be such that a **simple drawing** can readily be made of them.
5. The letters forming the name of the object must be such as can be **regularly and distinctly sounded**.

II. A set of **movable letters** are used in connection with the scheme. These movable letters are now introduced in their order, and the word is **set up** by means of a *word builder*.

III. Exercises follow.

1. The sounds are made for the letters shown.
2. The children are always told to associate a certain sound with a certain letter.

The method deals with a *whole word*, takes it to pieces, notes the sounds, and connects these again to form the word. The analytic-synthetic nature of the method is thus revealed. By its supporters it is claimed to be a *natural method*, because it teaches the children to associate the *sounds* with the letters and written symbols, but *not the names* of them.

3. After mastering a few such type words as *map, cap, hat, and fan*, all of which have been carefully selected, **fresh combinations** with the eight sounds of *a, e, f, h, m, p, t* (to be set up on the stand in this order) are made.

This step is a very important one, and at first the teacher must proceed very slowly and exercise all patience. As soon as the children can, *unaided*, connect the sounds which make the new word, a great deal has been achieved. Young teachers are too often tempted to tell the first word, but this is wrong. *The children should be allowed to find it out.*

4. The *Look-and-Say Method* is used for words of irregular notation. These words are taught as wholes, and *no attempt should be made to analyse them.*
5. To ensure still greater interest in the lesson, the *pupils have their own sets of loose letters*, which they keep in little boxes or bags. At first only those letters are used with which they have become acquainted. This practice recognises and utilises the child's love of activity.
6. The next step is **the writing of the type word**. A fair attempt at the written characters on their ruled slates is all that can be expected at first.
7. The last step is to place **a simple outline drawing of the object** alongside the word. This seldom fails to be imitated.

IV. The words to be taught by the *Phonic Method* are done in large type; the words on the *Look-and-Say Method* in small type, hence the name by which the method is known.

V. There is no doubt that this is one of the best applications of the Phonic Method that have yet been made, and a conscientious adherence to it would do much to remove some of the disadvantages under which that method is alleged to labour, *e.g.*, it has been asserted that no case of stammering has resulted from it within known experience. It has the further advantage of utilising a child's love of activity; of introducing the Kindergarten element; of basing instruction on concrete objects; and of utilising drawing and writing as aids. In fact, it recognises the chief consideration which underlies true methods of infant teaching, *viz.*, **the association of one lesson with another through some one leading idea.**

## HISTORY.

**The Historic Novel.**—What use, if any, should be made of Historic Novels in the teaching of History?

When we review the ordinary practice associated with the teaching of History in our schools, their use seems to be naturally **complementary**. They are, consciously or unconsciously, led up to by the scholar's training. The *History Lessons* may or may not be supplemented by the use

of the *History Book*, but they are generally aided by the use of *Historical Reading Books* with their interesting stories and biographies, and so the scholars are insensibly led up to the *Historic Novel*. Let it be granted then that every school library should contain a selection of such books carefully chosen by the head teacher or some other efficient and responsible person.

Perhaps their **recreative** element is their strongest recommendation, and in this capacity they are a fine preventive or antidote to the "penny dreadful" or the "shilling shocker". *One of the primary aims of every Reading Lesson is to implant a love of reading, and it should be equally one of the aims of every History Lesson to appropriate some portion of that created taste for the reading of History.* But with young people **all transitions should be easy**, and the *Historic Novel* offers that golden bridge by which the desired transition may be made, and the taste for more substantial efforts effected with riper years. Like most other novels, the book contains a plot and so presents all the *interest of pursuit*. It may embody all the *delights of romance* and those characteristics of the best modern fiction which appeal to the universal sympathies of our nature. Such books may thus satisfy that craving for the marvellous which is an attribute of all classes from the mansion to the cottage. Furthermore, there will sometimes be found a most successful mixture of the historical and the familiar, the junction of stirring and romantic elements with that popular humour which gives to the story the largeness and variety of life itself.

The **instructive** element contained in them is another recommendation, and that *instruction is received under the most favourable conditions*. The work is approached willingly, and is thoroughly enjoyed. The *interest* which the teacher is taxed to create and maintain in some other branches of school work is here ready-made for him in rich abundance, and none the less so because the pupil is rid of all those disciplinary restrictions which are essential to a class lesson. Nor does the fact that the characters, events, and descriptions are often fictitious detract appreciably from this, for they are often accurately suggestive or true in kind. Historic facts may be dressed up with such intense personal reality as to give the book an air of authentic narrative, an example of which may be seen in *Defoe's Memoirs of a Cavalier*, or the same author's *Journal of the Great Plague of London*. They often give those **true pictures of the everyday life and manners of the past** which limited time and other obstacles very often keep out of the school lesson. Nor is the *literary merit* of the book wasted. The appreciation of this may be beyond the average capacity of the class, but the subtle influence of good models of style will show itself sooner or later to the lasting advantage of the reader. It is true that the diet is a mixed one, compounded of fact and fiction, and it is equally true that authors often fill up the rents of time with matter of their own invention. But this is hardly a weakness, and it is certainly not an unpardonable offence. For it all aims at the same goal as the teacher in seeking to **implant a love for the subject among the people**.

Good historic novels tend to **elevate** the tone of the people, and *this influence is brought to bear in this case at the most plastic and impressionable period of life*. As civilisation gradually subdues the violent passions and impulses of society, the historic novel, among others, is more and more called into use to give an even and detailed development, not only of incident, but also of sentiment. Such books may present heroes whose

courage, sentiments of honour, chivalry, and delicacy must have a good ethical effect upon their readers. In the case of children, the moral influence of the book, like its literary influence, may not show immediate fruit. Children are too young to take delight in the delicate light and shade and the knowledge of human sentiments and passions they display, but they are going through a process of unconscious cultivation on these points also, and their passions are earnestly enlisted on the side of virtue. Furthermore, many of them are characterised by *good sense* and a *clear moral aim*. They may also embody social speculations and aspirations which may help to form the habit of serious reflection, and they will furnish instances of genuine feeling, together with life-like impersonations of manly and womanly character in all ranks.

A few historic novels are now named, but with no intention of limiting the teacher's choice. Most teachers will be able to vary, increase, or improve the list. They are merely offered as some sort of a suggestive aid to the younger teachers whose range of reading is naturally assumed to be somewhat narrower than that of their older colleagues.

Name of Book.	Author.	Period.
Harold	Lytton	Harold
Hereward the Wake	Kingsley	William I.
Lady Sybil's Choice	E. S. Holt	Crusades
Betrothed	Scott	"
Talisman	"	Richard I.
Ivanhoe	"	Edward II.
The Days of Bruce	Grace Aguilar	Edward III.
The Constable of the Tower	Ainsworth	"
White Company	Conan Doyle	Lollards
Mistress Margery	E. S. Holt	Wars of the Roses
Red and White	"	"
Last of the Barons	Lytton	Henry VII. or VIII.
Armourer's Apprentices	C. Yonge	Henry VIII.
Windsor Castle	Ainsworth	"
Henry VIII.	"	Queen Mary
For the Master's Sake	E. S. Holt	"
Cardinal Pole	Ainsworth	Elizabeth
Westward Ho	Kingsley	Mary, Queen of Scots
Monastery and the Abbot	Scott	Elizabeth
Kenilworth	"	"
Sister Rose (St. Barth.)	E. S. Holt	"
Unknown to History	C. Yonge	"
Fortunes of Nigel	Scott	James I.
Guy Fawkes	Ainsworth	"
Spanish Match	"	"
The Caged Lion	C. Yonge	"
Ovingdean Grange	Ainsworth	Charles I.
Legend of Montrose	Scott	Civil War
Woodstock	"	Civil War and Commonwealth
In the Golden Days	Edna Lyall	Charles II.
Peveril of the Peak	Scott	"
Old St. Paul's	Ainsworth	"
Plague of London	Defoe	"
Micah Clarke	Conan Doyle	James II.
James II.	Ainsworth	"
Preston Fight	"	George I.
Barnaby Rudge	Dickens	Gordon Riots
The Romance of War	James Grant	Peninsular War

**Stories in English History: their Preparation and Delivery.**—Where History is taught as a Class Subject, the work of the

first three years is practically confined to the relating of stories from English History. Plenty of scope is left to the teacher in the choice of the incidents, and a number of stories are mentioned as suitable. The teacher is at liberty to adopt a new set of stories for each year, or he may adopt the **Concentric Method** and deal with the same stories with expanding fullness each year. Fresh stories bring *fresh interest*, but, rightly handled, the Concentric Method will bring *added interest*. The one method *widens* the interests and sympathies, the other *intensifies* them; the one gives *breadth*, the other *depth*; hence, ever remembering that one of the teacher's chief aims is to implant a love for the subject, either method, in the hands of a skilful teacher, can be made very profitable.

But the teacher is not going to be a successful narrator without **preparation and training**. To make such lessons a success, *they must be delivered extempore*, or with no greater aid than a few "peg" notes. For young teachers, with limited powers and attainments, it will be especially desirable that they should *audibly rehearse* the lesson during the time devoted to its preparation. If they are not prepared to take this necessary trouble, they are strongly advised to leave the lessons alone, for a stumbling, halting, or timid delivery is most likely to destroy the primary object for which such lessons are given.

Assuming the teacher to be well prepared with the subject matter, his **manner and style of delivery** will next need attention. The "personal equation" enters strongly here, and handicaps him favourably or otherwise. It is probably no exaggeration to say that a certain amount of *dramatic ability* is essential for success. A mechanical drone in a slightly changing monotone is nothing more nor less than a soporific to young children, and must never be indulged in by the teacher on any account. A noisy delivery deadens with its din, to say nothing of the harm it does the teacher himself. It is true that all are not gifted alike in that bright and vivid style of narration so necessary to this type of lesson, yet, the greater the need, the greater the effort demanded, and that effort must be made. The teacher must enter into the situation of his hero, take on his emotions, and fairly interpret them to the class, and this will entail the cultivation of a *sympathetic nature* and *good vocal control*. The aid of *gesture* and the vivifying "*historic present*" should not be forgotten, for they enable the teacher to bring his hero or his incidents from the dim obscurity of the past into the vitalising atmosphere of the present.

**Language** will be the next difficulty. The vocabulary and style which suit the boy of seven will not fit the child of eleven. In young children there is a common desire to cast off the baby element at the earliest possible moment, and *nothing is more likely to chill the interest of the class than language which innocently snubs their self-esteem*. On the other hand, *there must be no shooting above their heads in the desire to spare their hearts*. Perhaps the best course to follow will be to consult some of the best of the *Historical Readers* in use in the schools, and to study the styles of language used there for each standard, and, speaking generally, it will be wise if the bulk of the preparation is done from such books for lessons of this kind.

When preparing the lesson the choice of the **subject matter** may sometimes present difficulties. *Young teachers err on the side of too much rather than too little. They are too anxious to make their lessons exhaustive rather than suggestive and instructive.* Where good *Historical Readers* are available this difficulty disappears. But where aids of this kind are not available, such incidents should be chosen as are most likely to interest

the class, and to unobtrusively suggest some moral lesson. Accuracy is desirable, but not absolutely essential in the earlier lessons, and, consequently, the teacher may make some use of the stories interwoven in our ballads and legends (see page 296).

The material and artistic element in the lesson should not be neglected. Toys, models, historic relics, maps, pictures, etc., should all be pressed into the service of the lesson where opportunity offers. Visits to museums, public and historic buildings (such as old castles, walls, gates, churches, etc.), should be made, and, generally, every suitable and obtainable objective aid should be utilised.

**The Teaching of Social Questions.**—The teaching of the social life of the people opens up a wide field of work, but so far as these hints are concerned, they are limited to such subjects as *Clothing, Food, Dwellings, and Amusements*. The question of clothing only will be dealt with here, but the other subjects might be treated in a similar way.

**Clothing.**—Questions like this, properly handled, may be made to throw a flood of light on the social life of the people, and that, too, in a way which is not only *practical and interesting*, but which permits some exercise of the *reasoning powers*, brings out in *vivid contrast* the condition of the people of to-day, and gives a *good object lesson* in that contentment which is an important factor in the abiding peace and prosperity of any country. To make these points effective it will be necessary, not only to describe the dress of "society," but that of the poorer classes also. The dress of the labouring class in the "good old times" of song and novel will be more interesting to the children of their successors than that of any other class, and more profitable for making those *comparisons* which ought to be a feature of all these lessons.

The dress of the period should be **accurately described** with the aid of suitable **pictures or drawings** of sufficient size to be seen by the class. These drawings might be prepared before the lesson, but the teacher is wasting a good opportunity for arousing and maintaining interest if they are not executed on the B.B. *during the lesson*. Each article could be rapidly sketched as described, and it is worth the teacher's while to practise B.B. drawing for this and similar lessons. If a **museum** should be near which contains the necessary specimens, the children should be taken to see them. Similarly, any **local collection of pictures** containing the necessary illustrations should be visited. This is the more necessary, because B.B. sketching alone, although most desirable for individual garments, gives little or no idea of the general appearance of the dress as a whole. But under any condition, the lesson should be either **objective or pictorial**, or both. *A lesson of this nature which is purely descriptive is doomed to failure, however skilful the teacher may be at word painting.* The materials supplied to the children for their efforts of constructive imagination would be mere abstractions to them, and the completed effort, if it could be known, would probably be inaccurate in every case. Hence, such lessons, to be successful, must be objective and pictorially illustrated.

**Comparison and contrast** might then be brought into play. Each article might be compared or contrasted with its modern substitute or modification, the points of likeness or unlikeness indicated, and the necessary **inferences** made as to the greater or less degree of the suitability of modern dress to climate and the altered conditions of life. The lesson would thus receive a **practical application**, which should bring something more than mental profit only.



In preparing such lessons, the teacher will have to formulate a series of questions which will make the mental demands desired, and lead up to the practical results pointed out ; e.g., the following are suggestive rather than exhaustive :—

1. Did it keep the body at a nearly uniform temperature, and that temperature a suitable one? Did it allow free play to the powers of the skin—perspiration, absorption, and feeling? Was it woollen, cotton, silk, linen, etc.? With the poor people, did it change for the seasons, and if so, to what extent? Was it adapted to the body? Did it allow the body the full exercise of all its motions? The answers to such questions, among other things, would reveal, not so much the knowledge of the time as to the scientific principles which should regulate clothing, but *how far these principles were applied.*
2. Was it showy, extravagant, or neat in its style? *Did politics or creed have any modifying influence?* Was there any marked difference in its style or texture between the different grades of society, and if so, how far was the quality of the dress considered a measure of social standing? Was the difference in this respect more or less marked then than now, and if so, why? Were there any laws regulating dress, and if so, why?

Give the *average wage* of the artisan and labouring classes, and, if possible, the *cost of living*, including food, shelter, and clothing. The class will then be in a position to infer the capacity of the poor to clothe themselves, and their consequent comfort or discomfort in winter.

The answers to such questions, aided by the information suggested, would in some degree reveal the measure of the taste of the people, and the degree of luxury indulged in by them. In neither case would it be a sole test ; but in each a valuable and suggestive one. *Here again, contrast and comparison with the present should be utilised.*

3. Was it varied, and if so, for what purpose? The answer to such a question would again give much information on the social life and habits of the people, and a rich field of observation would be opened out by a comparison or contrast with the varied dress of the present day. Nor should the changed dress of the army and navy, the reasons for such changes, and their relative degrees of suitability be overlooked.

Obviously, the teacher will not be able to crowd all these points into one lesson. A selection, both in kind and quantity, must be made and thoroughly dealt with. A few points, well described, illustrated pictorially, and well worked out with objective aids, will be far better than trying to crowd in a mass of detail which only breeds weariness or gives mental indigestion. It is necessary to emphasise this point, for *it is this overcrowding of the subject matter which experience shows to be the most common fault of young teacher*

## NATURE STUDY.

Nature Study is the study of the superficial aspect of Nature as contrasted with the study of that deeper and fuller aspect of Nature termed Science. It is not Science, but a part of general education. Science teaching belongs to a later period. Nature Study may lead up to scientific studies, but it is complete in

itself. The essentials of such a study will embrace (1) *seeing* what one looks at—"positive, direct, discriminating, *active* observation"; (2) *understanding* so far as possible *why* the thing is so, and (3) *desiring* to know more about the thing. Viewed in this light, Nature Study is a "process by which simple natural objects and events acquire meaning" and interest. Its value does not lie so much in the acquisition of any particular information, as in fostering in the mind an attitude of observational alertness.

The necessity for Nature Study as a powerful humanistic agency is generally recognised. It is an attempt to make the children realise the divinity that is implanted in nature around them, and to inspire them with a love for the beauty of life. With inspiration, says Mr. Tadd, comes energy—physical, mental, spiritual. All Nature becomes eloquent of the Great Creator, and the children are thus led to find tongues in trees, books in running brooks, sermons in stones and good in everything. Nature, says Ruskin, however simply observed or imperfectly known, is, in the degree of the affection felt for it, protective and helpful to all that is noblest in humanity; and the living power in all real schools, be they great or small, is love of nature.

Children have been taught to read too exclusively from *man's* book; the great book of Nature has been too much neglected. Hence the cry for Nature Study represents the reaction against mere book-knowledge. It is felt that a study is required which should appeal to the rural instincts of urban dwellers; also, that country children on leaving school should have been so trained as to find themselves in sympathy with their environment, and thus be fitted to take an intelligent interest in the life that surrounds them.

**Different views regarding Nature Study.**—Now while little difference of opinion exists regarding the necessity for Nature Study, there is little, if any, unanimity regarding its scope and its position in the curriculum of our schools. A brief examination of some of these methods will be illuminative. The young teacher will then know, in some cases at least, what *not* to do.

There is the *Book Method*. Now those who use it shut their eyes to the first-hand evidence of Nature, and confine their own and their pupils' attention to second-hand evidence contained within the covers of some manual on "Nature Knowledge". This is really bookish education masquerading in new attire.

Then there is the *Object-Lesson Method*. Teachers using this method draw up a series of Object Lessons and call the course Nature Study. Object Lessons are an important part of school work and of Nature Study, but the terms Object Lessons and Nature Study are not convertible; the latter embraces more than the former.

To these may be added that method which is an easy combin-

ation of *Elementary Science and sentimentalism*. Children are given a lesson on "Flowers," are exhorted to love flowers and are perhaps taught some poetry about flowers; or they are given a lesson on some animal, and occasion is taken to inculcate the duty of kindness to animals. Such teaching has its place, and a high place, in the curriculum, but the *direct* inculcation of sentiment is no part of Nature Study *per se*.

Finally, there is the method of *Opportunism*, the informal dissertation upon some object or natural phenomenon. A boy brings a dead mole to school, and the teacher talks about the life and habits of the mole; or a lesson is interrupted during a storm to explain the cause of thunder and lightning, and so on. This is mere *chatting* about Nature, not *Nature Study*, and is likely to degenerate into loquacity on the part of the teacher and passive receptivity on the part of the pupil.

**Branches of Nature Study.**—Some suggestions for the prosecution of Nature Study are now given. No teacher can or will endeavour to deal with *all* the subjects enumerated. His choice will be determined by locality, the home-life of his pupils, and his own knowledge and predilections.

**1. Weather Study.**—Daily observations can be made of the weather. The temperature can be noted, also the force and direction of the wind, the height of the sun at noon, the amount and kind of clouds, etc. Each class should keep a weather diary. In the junior classes, everyday expressions such as "cloudy," "wet," "windy," "warm," will be sufficiently descriptive. In the upper classes, daily readings of the thermometer and barometer might be made and the amount of rainfall roughly measured. Formal lessons on Clouds, Rain, Hail, Snow, Dew, Draughts, Winds, might be given *after* a prolonged course of weather observation.

**2. The School Garden.**—Part of the school garden might be common property, part allocated to certain children or groups of children. The changes seen in the garden from month to month might be noted: common shrubs, herbs and weeds observed, compared and contrasted. Seeds, germination, seedlings, buds, leaves, flowers, roots should all receive attention. Animal life in the garden (insects, snails, worms, etc.) can also be studied.

**3. Local Organic Life.**—Pets and domestic animals, wild animals and game, the birds, the reptiles and the fish in the streams are some of the subjects on the zoological side. The life-history and habits of one or two may be specially studied. Aquaria and vivaria can be kept in the classroom; but these devices should supplement and not supplant the study of life in its natural habitat. On the botanical side there are such subjects as the common wild flowers, the chief trees and the life-history of typical plants. The common names only should be taught, the naked eye characteristics alone studied; Latin and Greek terminology and the microscope have their proper place in Science,

but they are out of place in Nature Study. With older children, such topics as the adaptation of means to ends and the struggle for existence are interesting subjects arising out of Nature Study.

**4. Minerals.**—The stones on the roadside, the pebbles found in streams and rivers, the surface rocks and soils, the railway cutting, the quarry, the mine, the landslip and the sea-shore, useful minerals and their connection with local industries are some of the many themes which readily suggest themselves.

**5. Topography.**—The topography of the neighbourhood is admirably adapted for Nature Study, and co-ordinates the study of Nature with the study of Geography.

Mr. Tadd says that all the usual agencies for Nature Study are useless unless supported by *art*. Rambles, Object Lessons, chats about Nature, etc., are fruitless without the aid of drawing, large and small, on paper and B.B. For success he asserts that permanent organic impressions must be made and that to do this the impressions must be repeated systematically. But without art even repetition might fail. Art methods will cause the child to take pains, and will arouse his emotions to a point of love and sympathy from the nature and purpose of the work involved. Nature will be loved when she is appreciated, and drawing brings that appreciation. The union of thought and action has to be made complete and automatic. Drawing, like language, is a mode of expression, and it is the doing of things through a number of modes of expression (composition, drawing, modelling, etc.) that calls forth the necessary mental and emotional powers for stamping impressions eternally on the mind. The drawings, of course, must be made from the natural objects and not from copies. The latter course would be Nature Study with the *nature* left out.

**The School Excursion.**—This is an important adjunct of Nature Study, possessing certain distinct advantages as a method of training and instruction. Accurate first-hand knowledge of things *in situ* is thus obtained; powers of observation are developed, as well as the ability to concentrate the attention upon a few things at a time; self-reliance is encouraged; rational recreation and healthy hobbies are generated; a love of nature is cultivated; and the teacher and class get to know and appreciate each other from the wider and freer relationship set up between them.

The actual excursion should be preceded by a preparatory lesson in the classroom. The children should be given some idea of what they are going to see and how best to see it. The excursion will then be much more interesting and much more profitable to them. There should be at least one teacher for every twenty children. While aimless wandering should be discouraged, reasonable liberty should be permitted. Due respect should be demanded for the property of other people. Objects of general and special interest should be pointed out, but the open-air teach-

*ing* should be as brief as possible. Nature should be the teacher, not the schoolmaster. Illustrative specimens should be taken back to the classroom, where the main points learned during the excursion should be summarised, connected with previous knowledge, and used as a means for the acquisition of new knowledge.

## ADDITIONAL EXAMINATION QUESTIONS.

### SCHOOL ECONOMY.

- 13.—Give a few good rules to be observed in school for the protection of the eyesight.  
 14.—Describe any means by which "Thrift" may be encouraged among the children of your class.  
 15.—What are the advantages of having the various changes of lessons, etc., in school executed by means of drill? Describe a good desk drill.

### DISCIPLINE.

- 26.—Show how school discipline may be useful in forming habits of punctuality and prompt obedience to orders.  
 27.—Describe any means by which the interest of the parents of the children in the school and its work may be awakened and sustained.

### CLASSIFICATION.

- 13.—Make out a syllabus of work to be done by the end of the first quarter of the school year for :—  
     (a) First Class, Infants, *or*  
     (b) The Fourth Standard.  
 14.—What are the principal advantages of having a good Time Table?

### CLASS TEACHING.

- 7.—It is often found that the answering in class subjects is confined to a few of the children. What are the causes of this, and how would you remedy it?  
 8.—Describe the examination which you would give in the various subjects to children of the First Class in an Infant School.

### OBJECT LESSONS.

- 14.—What are the uses of a course of Object Lessons to Standard III.? Make a list of ten suitable lessons.  
 15.—Notes of Lessons on Tin; the Leaves of Trees; the Foot Rule (for infants); a Railway Station (for infants).

### KINDERGARTEN.

- 17.—Give examples of varied occupations tending to promote invention among children from seven to ten years of age.  
 18.—Make out a list of six suitable occupations and games for babies, and describe the manner in which you would conduct them.  
 19.—Write out a list of six infant school songs, with actions, and describe in detail how you would teach one of them.  
 20.—Describe three or four good games (a) for infants *or* (b) for older scholars, in the playground, and say how you would teach one of them.

### ARITHMETIC.

- 54.—How would you teach children that—  
 $\frac{3}{4} \div \frac{2}{3} = \frac{3}{4} \times \frac{3}{2}$ ?  
 55.—What simple apparatus would you use in giving a first lesson on Fractions?  
 56.—Explain in a simple but rational way some method of taking 845 from 6321.  
 57.—State the rule for pointing in the multiplication of decimals, and justify this rule.  
 58.—What is meant by concrete examples in Arithmetic? Write out six that would be suitable :—  
     (a) For the Third Standard, *or*  
     (b) For the First Class in an Infant School.  
 59.—Frame some Questions in Mental Arithmetic for Standard II., having in view the preparation for the Arithmetic of Standard III.

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